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AGENCY DRAFT

RCRA Facility Investigation Draft Report Burlington Environmental Inc., Pier 91 Facility Seattle, Washington

EPA I.D. No. WAD 00081 2917

Volume IV - Appendix J

October 1993

Prepared for:

BURLINGTON ENVIRONMENTAL INC.

Project 624878



**BURLINGTON
ENVIRONMENTAL**

TECHNICAL SERVICES DIVISION
P.O. Box 3552
Seattle, Washington 98124-3552
(206) 223-0336

USEPA RCRA



3012995

APPENDIX J
Chemical Analysis Results
Groundwater Samples
April 1993

PROJECT MEMORANDUM

DATE: July 21, 1993
TO: Joe Depner, Hydrogeologist
FROM: Nels Cone, Chemist *NBC*
PROJECT: Burlington Pier 91 RFI
Project Number 624878
SUBJECT: VALIDATION OF GROUNDWATER ANALYTICAL RESULTS DATA SETS
10A-10C

On April 4, 1993, four water samples were collected by Burlington Environmental Inc. personnel. These samples were submitted to Sound Analytical Services of Tacoma, Washington for volatile organic (EPA SW-846 Method 8240), semivolatile organic (EPA SW-846 Method 8270), and Total Petroleum Hydrocarbon (EPA SW-846 Methods 418.1 and 8015 Modified) analyses (work order 31234). I performed a review of the analytical results for the samples listed below.

CP-104A-0493

CP-104B-0493

CP-105A-0493

CP-105B-0493

A properly completed chain-of-custody form was included (6319). The sample was shown as having been properly iced and received in good condition. Holding times were evaluated according to regulatory protocol (*National Functional Guidelines for Organic Data Review*, USEPA, 1990). The sample received the analyses required by the Quality Assurance Project Plan (QAPP), and laboratory extraction/analysis times met the established guidelines. Proper data qualifier flags were used by the laboratory with the exceptions noted below.

Data Set 10A:

For volatile analyses, the holding times met USEPA requirements. The method blank contained methylene chloride and acetone; results received the proper "B" data qualifier flag as needed. All surrogate recoveries were within required quality control (QC) limits. Matrix spike/matrix spike duplicate analyses demonstrated appropriate analytical accuracy and relative percent differences (RPD) between the two analyses indicate acceptable analytical precision. Supporting QC documentation included bromofluorobenzene tuning data, continuing calibration verification, and sample chromatograms. Data consistency was demonstrated throughout.

Data Set 10B:

The holding times for semivolatile analyses met USEPA requirements. Di-n-butylphthalate, di-n-octylphthalate and bis(2-ethylhexyl)phthalate appear as laboratory contaminants; results for these analytes did not always receive the required "B" data qualifier flag. Surrogate recoveries for the sample were within QC limits. Matrix spike/matrix spike duplicate (MS/MSD) analyses were within established QC limits. The RPDs indicate acceptable analytical precision.

Page 2

Memorandum from Nels Cone

Subject: Pier 91 Data Validation, Data Set #10A-10C

July 21, 1993

Supporting QC documentation included decafluorotriphenylphosphine tuning data, continuing calibration verification and sample chromatograms. Data consistency was demonstrated throughout.

Data Set 10C:

Results from Total Petroleum Hydrocarbon analyses indicate that holding times for this sample satisfied USEPA requirements. Surrogate recoveries were within required QC limits. Duplicate analyses were performed, and appropriate analytical precision is displayed. Matrix spike analyses indicate required analytical accuracy was achieved. The method blank analysis results met required QC criteria and no corrections were needed. Supporting QC documentation included continuing calibration curves along with sample, spike and method blank chromatograms. Data consistency was demonstrated throughout.

RECOMMENDATIONS

In order to satisfy the data quality objectives as defined in Table F-2 of the QAPP, the following actions should be taken. All reported detections of di-n-butylphthalate, di-n-octylphthalate and bis(2-ethylhexyl)phthalate should receive "B" data qualifier flags. This data set can then be considered valid for its intended use.

PROJECT MEMORANDUM

DATE: July 26, 1993
TO: Joe Depner, Hydrogeologist
FROM: Nels Cone, Chemist *NAC*
PROJECT: Burlington Pier 91 RFI
Project Number 624878
SUBJECT: VALIDATION OF GROUNDWATER ANALYTICAL RESULTS DATA SETS
10D-10E

During the period of April 5 to 14, 1993, thirty-two water samples were collected by Burlington Environmental field personnel. These samples were submitted to Burlington Corporate Laboratory for metals analysis (EPA SW-846 Methods 3010, 6010 and 7000 series) and PCB analysis (EPA SW-846 Method 8080), (work orders 46052, 46076, 46115, 46145, 46175, 46209, 46245 and 46278). I performed a review of the analytical results for the following samples:

CP-W10-0493	CP-106A-0493	CP-111-0493	CP-116M-0493
CP-39-3-0493	CP-106B-0493	CP-112-0493	CP-117-0493
CP-103A-0493	CP-107-0493	CP-113-0493	CP-118-0493
CP-103B-0493	CP-108A-0493	CP-114-0493	CP-119-0493
CP-104A-0493	CP-108B-0493	CP-115A-0493	CP-121-0493
CP-104B-0493	CP-109-0493	CP-115B-0493	CP-122B-0493
CP-105A-0493	CP-109M-0493	CP-115M-0493	CP-911-0493
CP-105B-0493	CP-110-0493	CP-116-0493	CP-915A-0493

Findings

Properly completed chain-of-custody forms were included (numbers 6330, 6224, 6328, 6324, 6320, 6321, 6277 and 6286). The samples were shown as having been properly iced and received in good condition. All holding times were evaluated according to regulatory protocol (*National Functional Guidelines for Organic (and Inorganic) Data Review*, USEPA, 1991). The samples received the analyses required by the Quality Assurance Project Plan (QAPP), and laboratory extraction/analysis times met the established guidelines. Field duplicate results indicate that appropriate analytical precision was achieved.

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Memorandum from Nels Cone

Subject: Data Validation of Analytical Results, Data Sets 10D-10E

July 26, 1993

10D

For metal analysis, matrix spike/matrix spike duplicate results displayed analytical accuracy within USEPA guidelines. Method blank data were within quality control (QC) limits. All laboratory control samples, initial calibration verification, and continuing calibration verification data met requisite criteria for analytical precision.

10E

Surrogate recoveries for all PCB analyses were within QC limits with the exception of tetrachloro-m-xylene (TCMX) recovery for sample CP-122B-0493; overall, the data remain unaffected. When samples required dilution, a corresponding increase in reported quantitation limits (PQLs) was noted. All method blank data met QC criteria. Matrix spike/matrix spike duplicate results satisfied QC criteria for analytical accuracy. Continuing calibration verification provided further demonstration of analytical precision. The data quality objectives as defined in Table F-2 of the QAPP are met. Proper data qualifiers were used by the laboratory as needed.

Recommendations

These data can be considered valid for their intended use.

PROJECT MEMORANDUM

DATE: July 21, 1993
TO: Joe Depner, Hydrogeologist
FROM: Nels Cone, Chemist *MC*
PROJECT: Burlington Pier 91 RFI
Project Number 624878
SUBJECT: VALIDATION OF GROUNDWATER ANALYTICAL RESULTS DATA SETS
11A-11D

During the period of April 6-14, 1993 twenty-^{nine}eight water samples were collected by Burlington Environmental Inc. personnel. These samples were submitted to Sound Analytical Services of Tacoma, Washington for volatile organic (EPA SW-846 Method 8240), semivolatile organic (EPA SW-846 Method 8270, material density (Standard Method 213E) and Total Petroleum Hydrocarbon (EPA SW-846 Methods 418.1 and 8015 Modified, and WDOE Method WTPH-HCID) analyses (work orders 31280, 31308, 31340, 31367, 31409, 31428, and 31448). I performed a review of the analytical results for the samples listed below.

CP-W10-0493	CP-108A-0493	CP-113-0493	CP-117-0493
CP-39-3-0493	CP-108B-0493	CP-114-0493	CP-118-0493
CP-103A-0493	CP-109-0493	CP-115A-0493	CP-119-0493
CP-105A-0493	CP-109M-0493	CP-115B-0493	CP-121-0493
CP-106A-0493	CP-110-0493	CP-115M-0493	CP-122B-0493
CP-106B-0493	CP-111-0493	CP-116-0493	CP-911-0493
CP-107-0493	CP-112-0493	CP-116M-0493	CP-915A-0493

Properly completed chain-of-custody forms were included (numbers 6225, 6322, 6323, 6325, 6287, 6326, and 6327). The samples were shown as having been properly iced/refrigerated and received in good condition. Holding times were evaluated according to regulatory protocol (*National Functional Guidelines for Organic Data Review*, USEPA, 1990). The samples received the analyses required by the Quality Assurance Project Plan (QAPP), with all field holding and laboratory extraction/analysis times meeting the established guidelines. Proper data qualifier flags were used by the laboratory with the exceptions noted below. Field duplicate results indicate that appropriate analytical precision was achieved for all analyses.

Data Set 11A:

For volatile analysis, all sample holding times met USEPA guidelines. The method blanks contained methylene chloride, acetone, and toluene; results did not always receive the required "B" data qualifier flag. Trip blank results were consistent with those of the laboratory method blank. All surrogate recoveries were within required quality control (QC) limits. Matrix spike/matrix spike duplicate analyses demonstrated appropriate analytical accuracy. Several samples required dilution, resulting in

July 21, 1993

a corresponding increase in reported quantitation limits (PQLs). Supporting QC documentation in the form of bromofluorobenzene tuning data and continuing calibration verification was provided.

Data Set 11B:

Holding times for semivolatile analyses of all samples satisfied USEPA requirements. Both di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected as laboratory contaminants; results for these analytes did not always receive the required "B" data qualifier flag. Surrogate recoveries for all samples were within QC limits except when samples received significant dilution specifically samples CP-115A-0493 and CP-117-0493. This dilution also resulted in elevated PQLs for these samples. Matrix spike/matrix spike duplicate analyses display analytical accuracy within QC limits with the exception of 1,4-dichlorobenzene and 1,2,4-trichlorobenzene. Overall, analytical accuracy remains intact because these analytes were not detected in the samples and the RPDs between these two results indicate acceptable analytical precision. Supporting QC documentation in the form of decafluorotriphenylphosphine tuning data and continuing calibration verification was provided.

Data Set 11C:

Holding times for Total Petroleum Hydrocarbon analyses of all samples satisfied USEPA requirements. Surrogate recoveries were within required QC limits, except as expected when samples being analyzed were actual product. Results from duplicate analyses displayed appropriate analytical precision. Matrix spike analyses indicate required analytical accuracy was achieved. The method blank analyses results met required QC criteria and no corrections were needed. Additional QC documentation in the form of laboratory check standards and initial and continuing calibration verification has been provided.

Data Set 11D:

Holding times for all samples satisfied USEPA requirements. Method blank analyses met required QC criteria and no corrections were needed. Duplicate analyses results indicate appropriate analytical precision was achieved. Laboratory check standard results display analytical accuracy within QC limits.

RECOMMENDATIONS:

In order to satisfy the data quality objectives as defined in Table F-2 of the QAPP, the following actions should be taken. All reported detections of methylene chloride and acetone should receive "B" data qualifier flags. All reported detections of di-n-butylphthalate and bis(2-ethylhexyl)phthalate should receive "B" data qualifier flags. These data can then be considered valid for their intended use.



BURLINGTON ENVIRONMENTAL

RECEIVED

May 10, 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

MAY 10 1993

Burlington Environmental Inc.
Technical Services

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46052

Dear Joe:

Four water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 05, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals and PCBs at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report. The PCBs were extracted and analyzed in batches. These dates are tabulated below. All PCB surrogates recovered between 50% and 150%.

Laboratory Number(s)	GC Run Number(s)	Date(s) Extracted	Date(s) Analyzed
46052-4, M04083-1, and B04083-1	AAKZ	4/08/93	4/13/93

The analyst(s) name(s) and the instrument used for each analyte are specified on the PCB report and are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure



BURLINGTON
ENVIRONMENTAL

General Laboratory Report

Lab Number : 46052

Plant/Generator Name : Pier 91; Project #624878 Task 7203

Sample Type : Groundwater; CP-105B, -105A, -104B, -104A

Date of Receipt : 04/05/93 Analyst: BB,EL,JLB,DKW

Date of Report : 05/07/93 QC Checked: *Kathy Guep*

Parameters for Analysis: Total and Dissolved Metals, PCBs

Outside Lab : None Outside Lab Report No:

Data:

These water samples from the Pier 91 Project #624878, Task 7203, sample numbers CP-105B-0493, CP-105A-0493, CP-104B-0493, CP-104A-0493, were analyzed for Total and Dissolved Metals by EPA Methods 7000 and 6010 and for PCBs by EPA Method 8080. Copies of the results are attached.

Comments and Conclusions:



CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6330

[illegible]

RELINQUISHED BY

RECEIVED BY

SIGNATURE		DATE	TIME	SIGNATURE		DATE	TIME
Louis A. La Rosa		4-5-93	1700	Garry Greps		4/5/93	1700
SHIPPING NOTES				LAB NOTES			

PCB Laboratory Report

Page 1

Lab Number : 46052

Plant/Generator Name : / PIER 91 Pj# 624878 TASK 7203

Sample Type : GROUNDWATER

Date of Receipt : 04/05/93

Analyst: BB, EL, JLB, DKW

Date of Report : 04/29/93

QC Checked: 40.5/3/93

Outside Lab : NONE

Outside Lab Report No:

Number of Samples :

<u>Run #</u>	<u>Sample ID</u>	<u>Code</u> <u>Numbers</u>	<u># Drums</u> <u>in Composite</u>	<u>Aroclor #</u>	<u>Total PCB</u> <u>(ppm)</u>
AAKZ40	46052-4	CP104A-0493			<1.0ppb
AAKZ41	CCV	5 PPM CCV (111%)		1254	5.56
AAKZ30	CCV	5 PPM CCV (111%)		1248	5.56
AAKZ27	B04083-1	BLANK			<0.1ppb
AAKZ26	M04083-1	METHOD SPIKE		1248	135%
AAKZ19	CCV	5 PPM CCV (89%)		1254	4.46

Instrument: Hewlett Packard 5890 G.C.

Analysts: Al Flores-Serrano and Della Kay Wilson

Metals Laboratory Report

Lab Number : 46052

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7203

Sample Type : GROUNDWATER

Date of Receipt : 04/05/93

Analyst: BB, EL, JLB

Date of Report : 04/16/93

QC Checked: *[Signature]* 4/16/93

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab : NONE

Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	46052-1 TOTAL	46052-1 DISS.	46052-2 TOTAL	46052-2 DISS.
Metals:	CP-105B-0493	CP-105B-0493	CP-105A-0493	CP-105A-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	0.054	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

DATES ANALYZED: 4/9/93, 4/12/93, 4/13/93, 4/14/93.

Metals Laboratory Report

Lab Number : 46052

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7203

Sample Type : GROUNDWATER

Date of Receipt : 04/05/93

Analyst: BB, EL, JLB

Date of Report : 04/16/93

QC Checked:

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab : NONE

Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	46052-3 TOTAL	46052-3 DISS.	46052-4 TOTAL	46052-4 DISS.
Metals:	CP-104B-0494	CP-104B-0494	CP-104A-0494	CP-104A-0494
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: April 26, 1993

TO: Burlington Environmental, Technical Services

PROJECT NAME: Pier 91

PROJECT NUMBER: 624878-7603

LABORATORY NUMBER: 31234

Enclosed are one original and one copy of the Tier III data deliverables package for Laboratory Work Order Number 31234. Four samples and a trip blank were received for analysis at Sound Analytical Services, Inc., on 4/06/93.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,



ANDREW J. RIDDELL
Project Manager

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

April 26, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7603

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 31234

The samples were taken on 4/05/93 and were received at Sound on 4/06/93. The samples were analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons by EPA Method 418.1 modified for soil, and Total Petroleum Fuel Hydrocarbons by EPA Method 8015 modified.

VOLATILE ORGANICS

Samples 31234-1 through 31234-5 were analyzed on 4/10/93 and 4/12/93. Methylene chloride and acetone were detected in the method blanks at levels above the IDL. Results reported for these compounds in the associated samples were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS

Samples 31234-1 through 31234-4 were extracted on 4/07/93 and analyzed on 4/07/93 and 4/08/93. No compounds were detected in the method blank above the IDL. All QC parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS

Samples 31234-1 through 31234-4 were extracted on 4/07/93 and analyzed on 4/11/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS

Samples 31234-1 through 31234-4 were extracted on 4/07/93 and analyzed on 4/09/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental, Date: April 14, 1993
Technical Services

Report On: Analysis of Water

Lab No.: 31234

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IDENTIFICATION:

Samples received on 04-06-93

Project: 624878-7306 Pier 91

ANALYSIS:

Lab Sample No. 31234-1

Client ID: CP105B-0493

Volatile Organics by Method 8240

Date Analyzed: 4-12-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	ND	5	
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	11	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical
 Project: 624878-7306 Pier 91
 Page 2 of 26
 Lab No. 31234
 April 14, 1993

Lab Sample No. 31234-1

Client ID: CP105B-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	2.3	5	J
Chlorobenzene	ND	5	
Ethyl Benzene	2.7	5	J
Styrene	ND	5	
Total Xylenes	5.8	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	100	88 - 110	81 - 117
Bromofluorobenzene	96	86 - 115	74 - 121
1,2-Dichloroethane-D4	114	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical
Project: 624878-7306 Pier 91
Page 3 of 26
Lab No. 31234
April 14, 1993

Lab Sample No. 31234-1

Client ID: CP105B-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-7-93

Date Analyzed: 4-8-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	30	
bis(2-Chloroethyl) ether	ND	30	
2-Chlorophenol	ND	30	
1,3-Dichlorobenzene	ND	30	
1,4-Dichlorobenzene	ND	30	
Benzyl Alcohol	ND	60	
1,2-Dichlorobenzene	ND	30	
2-Methylphenol	ND	30	
bis(2-Chloroisopropyl) ether	ND	30	
4-Methylphenol	ND	30	
N-Nitroso-Di-N-propylamine	ND	30	
Hexachloroethane	ND	30	
Nitrobenzene	ND	30	
Isophorone	ND	30	
2-Nitrophenol	ND	30	
2,4-Dimethylphenol	ND	30	
Benzoic Acid	ND	150	
bis(2-Chloroethoxy) methane	ND	30	
2,4-Dichlorophenol	ND	30	
1,2,4-Trichlorobenzene	ND	30	
Naphthalene	ND	30	
4-Chloroaniline	ND	60	
Hexachlorobutadiene	ND	30	
4-Chloro-3-methylphenol	ND	60	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical
Project: 624878-7306 Pier 91
Page 4 of 26
Lab No. 31234
April 14, 1993

Lab Sample No. 31234-1

Client ID: CP105B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	30	
Hexachlorocyclopentadiene	ND	30	
2,4,6-Trichlorophenol	ND	30	
2,4,5-Trichlorophenol	ND	30	
2-Chloronaphthalene	ND	30	
2-Nitroaniline	ND	150	
Dimethyl phthalate	ND	30	
Acenaphthylene	ND	30	
2,6-Dinitrotoluene	ND	30	
3-Nitroaniline	ND	150	
Acenaphthene	ND	30	
2,4-Dinitrophenol	ND	150	
4-Nitrophenol	ND	150	
Dibenzofuran	ND	30	
2,4-Dinitrotoluene	ND	30	
Diethylphthalate	ND	30	
4-Chlorophenyl phenyl ether	ND	30	
Fluorene	ND	30	
4-Nitroaniline	ND	150	
4,6-Dinitro-2-methylphenol	ND	150	
N-Nitrosodiphenylamine	ND	30	
4-Bromophenyl phenyl ether	ND	30	
Hexachlorobenzene	ND	30	
Pentachlorophenol	ND	150	
Phenanthrene	ND	30	
Anthracene	ND	30	
Di-n-butylphthalate	ND	30	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical
 Project: 624878-7306 Pier 91
 Page 5 of 26
 Lab No. 31234
 April 14, 1993

Lab Sample No. 31234-1

Client ID: CP105B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	30	J
Pyrene	ND	30	
Butyl benzyl phthalate	ND	30	
3,3'-Dichlorobenzidine	ND	60	
Benzo(a)anthracene	ND	30	
Chrysene	ND	30	
bis(2-ethylhexyl)phthalate	26	30	
Di-n-octyl phthalate	ND	30	
Benzo(b)fluoranthene	ND	30	
Benzo(k)fluoranthene	ND	30	
Benzo(a)pyrene	ND	30	
Indeno(1,2,3-cd)pyrene	ND	30	
Dibenz(a,h)anthracene	ND	30	
Benzo(g,h,i)perylene	ND	30	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	70	35 - 114	23 - 120
2-Fluorobiphenyl	85	43 - 116	30 - 115
p-Terphenyl-d ₁₄	77	33 - 141	18 - 137
Phenol-d ₆	26	10 - 94	24 - 113
2-Fluorophenol	54	21 - 100	25 - 121
2,4,6-Tribromophenol	94	10 - 123	19 - 122

Continued

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April 14, 1993

Lab Sample No. 31234-1

Client ID: CP105B-0493

TPH Per EPA Method 418.1
Date Extracted: 4-7-93
Date Analyzed: 4-9-93

<u>Parameters</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-7-93
Date Analyzed: 4-11-93

<u>Parameters</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	104
o-terphenyl	129

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31234
April 14, 1993

Lab Sample No. 31234-2

Client ID: CP105A-0493

Volatile Organics by Method 8240
Date Analyzed: 4-10-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	B1, J
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	ND	5	
Acetone	1.3	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	J
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	1.8	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31234-2

Client ID: CP105A-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	100	88 - 110	81 - 117
Bromofluorobenzene	98	86 - 115	74 - 121
1,2-Dichloroethane-D4	110	76 - 114	70 - 121

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Lab Sample No. 31234-2

Client ID: CP105A-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-7-93

Date Analyzed: 4-7-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.6	
bis(2-Chloroethyl) ether	ND	9.6	
2-Chlorophenol	ND	9.6	
1,3-Dichlorobenzene	ND	9.6	
1,4-Dichlorobenzene	ND	9.6	
Benzyl Alcohol	ND	19	
1,2-Dichlorobenzene	ND	9.6	
2-Methylphenol	ND	9.6	
bis(2-Chloroisopropyl) ether	ND	9.6	
4-Methylphenol	ND	9.6	
N-Nitroso-Di-N-propylamine	ND	9.6	
Hexachloroethane	ND	9.6	
Nitrobenzene	ND	9.6	
Isophorone	ND	9.6	
2-Nitrophenol	ND	9.6	
2,4-Dimethylphenol	ND	9.6	
Benzoic Acid	ND	48	
bis(2-Chloroethoxy) methane	ND	9.6	
2,4-Dichlorophenol	ND	9.6	
1,2,4-Trichlorobenzene	ND	9.6	
Naphthalene	ND	9.6	
4-Chloroaniline	ND	19	
Hexachlorobutadiene	ND	9.6	
4-Chloro-3-methylphenol	ND	19	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31234-2

Client ID: CP105A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	9.6	
Hexachlorocyclopentadiene	ND	9.6	
2,4,6-Trichlorophenol	ND	9.6	
2,4,5-Trichlorophenol	ND	9.6	
2-Chloronaphthalene	ND	9.6	
2-Nitroaniline	ND	48	
Dimethyl phthalate	ND	9.6	
Acenaphthylene	ND	9.6	
2,6-Dinitrotoluene	ND	9.6	
3-Nitroaniline	ND	48	
Acenaphthene	ND	9.6	
2,4-Dinitrophenol	ND	48	
4-Nitrophenol	ND	48	
Dibenzofuran	ND	9.6	
2,4-Dinitrotoluene	ND	9.6	
Diethylphthalate	ND	9.6	
4-Chlorophenyl phenyl ether	ND	9.6	
Fluorene	ND	9.6	
4-Nitroaniline	ND	48	
4,6-Dinitro-2-methylphenol	ND	48	
N-Nitrosodiphenylamine	ND	9.6	
4-Bromophenyl phenyl ether	ND	9.6	
Hexachlorobenzene	ND	9.6	
Pentachlorophenol	ND	48	
Phenanthrene	ND	9.6	
Anthracene	ND	9.6	
Di-n-butylphthalate	9.1	9.6	J

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31234-2

Client ID: CP105A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.6	J
Pyrene	ND	9.6	
Butyl benzyl phthalate	ND	9.6	
3,3'-Dichlorobenzidine	ND	19	
Benzo(a)anthracene	ND	9.6	
Chrysene	ND	9.6	
bis(2-ethylhexyl)phthalate	2.8	9.6	
Di-n-octyl phthalate	ND	9.6	
Benzo(b)fluoranthene	ND	9.6	
Benzo(k)fluoranthene	ND	9.6	
Benzo(a)pyrene	ND	9.6	
Indeno(1,2,3-cd)pyrene	ND	9.6	
Dibenz(a,h)anthracene	ND	9.6	
Benzo(g,h,i)perylene	ND	9.6	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	73	35 - 114	23 - 120
2-Fluorobiphenyl	65	43 - 116	30 - 115
p-Terphenyl-d ₁₄	67	33 - 141	18 - 137
Phenol-d ₆	32	10 - 94	24 - 113
2-Fluorophenol	49	21 - 100	25 - 121
2,4,6-Tribromophenol	74	10 - 123	19 - 122

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Lab Sample No. 31234-2

Client ID: CP105A-0493

TPH Per EPA Method 418.1
Date Extracted: 4-7-93
Date Analyzed: 4-9-93

<u>Parameters</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	1.3	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-7-93
Date Analyzed: 4-11-93

<u>Parameters</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	100
o-terphenyl	126

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31234-3

Client ID: CP104B-0493

Volatile Organics by Method 8240
Date Analyzed: 4-12-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	J
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	ND	5	
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	1.9	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	12	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31234-3

Client ID: CP104B-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	2.3	5	J
Chlorobenzene	ND	5	
Ethyl Benzene	2.8	5	J
Styrene	ND	5	
Total Xylenes	4.9	5	J

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	104	88 - 110	81 - 117
Bromofluorobenzene	96	86 - 115	74 - 121
1,2-Dichloroethane-D4	110	76 - 114	70 - 121

Continued

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Lab Sample No. 31234-3

Client ID: CP104B-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-7-93

Date Analyzed: 4-8-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	28	
bis(2-Chloroethyl) ether	ND	28	
2-Chlorophenol	ND	28	
1,3-Dichlorobenzene	ND	28	
1,4-Dichlorobenzene	ND	28	
Benzyl Alcohol	ND	57	
1,2-Dichlorobenzene	ND	28	
2-Methylphenol	ND	28	
bis(2-Chloroisopropyl) ether	ND	28	
4-Methylphenol	ND	28	
N-Nitroso-Di-N-propylamine	ND	28	
Hexachloroethane	ND	28	
Nitrobenzene	ND	28	
Isophorone	ND	28	
2-Nitrophenol	ND	28	
2,4-Dimethylphenol	ND	28	
Benzoic Acid	ND	140	
bis(2-Chloroethoxy)methane	ND	28	
2,4-Dichlorophenol	ND	28	
1,2,4-Trichlorobenzene	ND	28	
Naphthalene	ND	28	
4-Chloroaniline	ND	57	
Hexachlorobutadiene	ND	28	
4-Chloro-3-methylphenol	ND	57	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31234-3

Client ID: CP104B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	28	
Hexachlorocyclopentadiene	ND	28	
2,4,6-Trichlorophenol	ND	28	
2,4,5-Trichlorophenol	ND	28	
2-Chloronaphthalene	ND	28	
2-Nitroaniline	ND	140	
Dimethyl phthalate	ND	28	
Acenaphthylene	ND	28	
2,6-Dinitrotoluene	ND	28	
3-Nitroaniline	ND	140	
Acenaphthene	ND	28	
2,4-Dinitrophenol	ND	140	
4-Nitrophenol	ND	140	
Dibenzofuran	ND	28	
2,4-Dinitrotoluene	ND	28	
Diethylphthalate	ND	28	
4-Chlorophenyl phenyl ether	ND	28	
Fluorene	ND	28	
4-Nitroaniline	ND	140	
4,6-Dinitro-2-methylphenol	ND	140	
N-Nitrosodiphenylamine	ND	28	
4-Bromophenyl phenyl ether	ND	28	
Hexachlorobenzene	ND	28	
Pentachlorophenol	ND	140	
Phenanthrene	ND	28	
Anthracene	ND	28	
Di-n-butylphthalate	ND	28	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31234-3

Client ID: CP104B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	28	J
Pyrene	ND	28	
Butyl benzyl phthalate	ND	28	
3,3'-Dichlorobenzidine	ND	57	
Benzo(a)anthracene	ND	28	
Chrysene	ND	28	
bis(2-ethylhexyl)phthalate	46	28	
Di-n-octyl phthalate	4.3	28	
Benzo(b)fluoranthene	ND	28	
Benzo(k)fluoranthene	ND	28	
Benzo(a)pyrene	ND	28	
Indeno(1,2,3-cd)pyrene	ND	28	
Dibenz(a,h)anthracene	ND	28	
Benzo(g,h,i)perylene	ND	28	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	80	35 - 114	23 - 120
2-Fluorobiphenyl	93	43 - 116	30 - 115
p-Terphenyl-d ₁₄	85	33 - 141	18 - 137
Phenol-d ₆	27	10 - 94	24 - 113
2-Fluorophenol	49	21 - 100	25 - 121
2,4,6-Tribromophenol	100	10 - 123	19 - 122

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Lab Sample No. 31234-3

Client ID: CP104B-0493

TPH Per EPA Method 418.1
Date Extracted: 4-7-93
Date Analyzed: 4-9-93

<u>Parameters</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-7-93
Date Analyzed: 4-11-93

<u>Parameters</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	81
o-terphenyl	128

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab Sample No. 31234-4

Client ID: CP104A-0493

Volatile Organics by Method 8240
Date Analyzed: 4-10-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	3.8	10	J
Chloroethane	4.1	10	J
Methylene Chloride	ND	5	
Acetone	1.4	50	B1, J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	15	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	2.5	5	J
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31234-4

Client ID: CP104A-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	1.1	5	J
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	J
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	10	5	
Chlorobenzene	ND	5	
Ethyl Benzene	4.2	5	
Styrene	ND	5	
Total Xylenes	20	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	95	88 - 110	81 - 117
Bromofluorobenzene	99	86 - 115	74 - 121
1,2-Dichloroethane-D4	109	76 - 114	70 - 121

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Lab Sample No. 31234-4

Client ID: CP104A-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-7-93

Date Analyzed: 4-8-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.8	
bis(2-Chloroethyl) ether	ND	9.8	
2-Chlorophenol	ND	9.8	
1,3-Dichlorobenzene	ND	9.8	
1,4-Dichlorobenzene	ND	9.8	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	9.8	
2-Methylphenol	ND	9.8	
bis(2-Chloroisopropyl) ether	ND	9.8	
4-Methylphenol	ND	9.8	
N-Nitroso-Di-N-propylamine	ND	9.8	
Hexachloroethane	ND	9.8	
Nitrobenzene	ND	9.8	
Isophorone	ND	9.8	
2-Nitrophenol	ND	9.8	
2,4-Dimethylphenol	ND	9.8	
Benzoic Acid	ND	49	
bis(2-Chloroethoxy)methane	ND	9.8	
2,4-Dichlorophenol	ND	9.8	
1,2,4-Trichlorobenzene	ND	9.8	
Naphthalene	5.5	9.8	J
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	9.8	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31234-4

Client ID: CP104A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	3.9	9.8	J
Hexachlorocyclopentadiene	ND	9.8	
2,4,6-Trichlorophenol	ND	9.8	
2,4,5-Trichlorophenol	ND	9.8	
2-Chloronaphthalene	ND	9.8	
2-Nitroaniline	ND	49	
Dimethyl phthalate	ND	9.8	
Acenaphthylene	ND	9.8	
2,6-Dinitrotoluene	ND	9.8	
3-Nitroaniline	ND	49	
Acenaphthene	42	9.8	
2,4-Dinitrophenol	ND	49	
4-Nitrophenol	ND	49	
Dibenzofuran	4.8	9.8	J
2,4-Dinitrotoluene	ND	9.8	
Diethylphthalate	ND	9.8	
4-Chlorophenyl phenyl ether	ND	9.8	
Fluorene	27	9.8	
4-Nitroaniline	ND	49	
4,6-Dinitro-2-methylphenol	ND	49	
N-Nitrosodiphenylamine	ND	9.8	
4-Bromophenyl phenyl ether	ND	9.8	
Hexachlorobenzene	ND	9.8	
Pentachlorophenol	ND	49	
Phenanthrene	4.0	9.8	J
Anthracene	2.4	9.8	J
Di-n-butylphthalate	7.7	9.8	J

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31234-4

Client ID: CP104A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	5.7	9.8	J
Pyrene	2.7	9.8	J
Butyl benzyl phthalate	ND	9.8	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	9.8	
Chrysene	ND	9.8	
bis(2-ethylhexyl)phthalate	3.5	9.8	J
Di-n-octyl phthalate	ND	9.8	
Benzo(b)fluoranthene	ND	9.8	
Benzo(k)fluoranthene	ND	9.8	
Benzo(a)pyrene	ND	9.8	
Indeno(1,2,3-cd)pyrene	ND	9.8	
Dibenz(a,h)anthracene	ND	9.8	
Benzo(g,h,i)perylene	ND	9.8	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	74	35 - 114	23 - 120
2-Fluorobiphenyl	67	43 - 116	30 - 115
p-Terphenyl-d ₁₄	69	33 - 141	18 - 137
Phenol-d ₆	32	10 - 94	24 - 113
2-Fluorophenol	50	21 - 100	25 - 121
2,4,6-Tribromophenol	29	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical
Project: 624878-7306 Pier 91
Page 24 of 26
Lab No. 31234
April 14, 1993

Lab Sample No. 31234-4

Client ID: CP104A-0493

TPH Per EPA Method 418.1
Date Extracted: 4-7-93
Date Analyzed: 4-9-93

<u>Parameters</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	15	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-7-93
Date Analyzed: 4-11-93

<u>Parameters</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	110
o-terphenyl	136

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

DATA QUALIFIER FLAGS

- ND: Indicates that the analyte was analyzed for but was not detected. The associated numerical value is the practical quantitation limit, corrected for sample dilution.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- C: The identification of this analyte was confirmed by GC/MS.
- B1: This analyte was also detected in the associated method blank. The reported sample results have been adjusted for moisture, final extract volume, and/or dilutions performed during extract preparation. The analyte concentration was evaluated prior to sample preparation adjustments, and was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was also detected in the associated method blank. However, the analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- E: The concentration of this analyte exceeded the instrument calibration range.
- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- A: This TIC is a suspected aldol-condensation product.
- M: Quantitation Limits are elevated due to matrix interferences.
- S: The calibration quality control criteria for this compound were not met. The reported concentration should be considered an estimated quantity.
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.
- X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.
- X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.
- X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results. Sample matrix is nonhomogeneous.
- X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike was diluted out during analysis.
- X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: RPD value for MS/MSD outside QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside QC limits due to matrix composition.
- X10: Surrogate recovery outside QC limits due to high contaminant levels.

CHAIN OF CUSTODY



CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6319

[illegible]

RELINQUISHED BY

RECEIVED BY

SIGNATURE		DATE	TIME	SIGNATURE		DATE	TIME
<i>[Signature]</i>		4-5-93	1700	<i>J. E. Palmer</i>		4-6-93	9:10A
<i>J. Palmer</i>		4-6-93	11:10A	<i>D. Nguyen</i>		4/6/93	11:10A
SHIPPING NOTES				LAB NOTES			



BURLINGTON ENVIRONMENTAL

RECEIVED

MAY 10 1993

May 10, 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Burlington Environmental Inc.
Technical Services

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46076

Dear Joe:

Four water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 6, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals and PCBs at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report. The PCBs were extracted and analyzed in batches. These dates are tabulated below. All PCB surrogates recovered between 50% and 150%.

Laboratory Number(s)	GC Run Number(s)	Date(s) Extracted	Date(s) Analyzed
46076-2, M04083-1, and B04083-1	AAKZ, CAFX	4/08/93	4/12/93, 4/27/93

The analyst(s) name(s) and the instrument used for each analyte are specified on the PCB report and are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure



BURLINGTON
ENVIRONMENTAL

General Laboratory Report

Lab Number : 46076

Plant/Generator Name : Pier 91; Project #624878 TASK 7306

Sample Type : Groundwater; CP-108-B, -108-A, -103-B, -103-A

Date of Receipt : 04/06/93 Analyst: BB,EL,JLB,DKW

Date of Report : 05/10/93 QC Checked: *Kathleen Quigley*

Parameters for Analysis: PCBs, Total and Dissolved Metals

Outside Lab : None Outside Lab Report No:

Data:

These four groundwater samples from the Pier 91 Project #624878, Task 7306, sample numbers CP-108-B-0493, CP-108-A-0493, CP-103-B-0493, CP-103-A-0493 were analyzed for PCBs by Method 8080 and for Total and Dissolved Metals by Methods 7000 and 6010. Copies of the results are attached.

Comments and Conclusions:



BURLINGTON ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6224

[illegible]

Lab Number : 46076

Plant/Generator Name : / PIER 91 Pj#624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/06/93

Analyst: BB,EL,JLB,DKW

Date of Report : 04/29/93

QC Checked: WJ 5/3/93

Outside Lab : NONE

Outside Lab Report No:

Number of Samples :

<u>Run #</u>	<u>Sample ID</u>	<u>Code Numbers</u>	<u># Drums in Composite</u>	<u>Aroclor #</u>	<u>Total PCB (ppm)</u>
AAKZ27	B04083-1	BLANK			<0.1ppb
AAKZ26	M04083-1	METHOD SPIKE		1248	135%
CAFX23	46076-2	CP-108-A-0493			<10ppb
AAKZ19	CCV	5 PPM CCV (89%)		1254	4.46
AAKZ30	CCV	5 PPM CCV (111%)		1248	5.57
)			
CAFX15	CCV	5 PPM CCV (101%)		1248	5.04
)			
CAFX26	CCV	5 PPM CCV (110%)		1248	5.49
)			

Instruments: Hewlett Packard 5890 and 5890 Series II G.C.s

Analysts: Al Flores-Serrano and Della Kay Wilson

Metals Laboratory Report

Lab Number : 46076

Plant/Generator Name : PIER 91 Pj#624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/06/93

Analyst: BB, EL, JLB

Date of Report : 04/19/93

QC Checked: *[Signature]* 4/19/93

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab : NONE

Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	46076-1 TOTAL	46076-1 DISS.	46076-2 TOTAL	46076-2 DISS.
Metals:	CP-108-B-0493	CP-108-B-0493	CP-108-A-0493	CP-108-A-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	0.011	0.011	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

DATES ANALYZED: 4/13/93, 4/14/93, 4/15/93, 4/16/93
4/19/93.

Metals Laboratory Report

Lab Number : 46076

Plant/Generator Name : PIER 91 Pj#624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/06/93

Analyst: BB, EL, JLB

Date of Report : 04/19/93

QC Checked: *[Signature]* 4/19/93

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab : NONE

Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46076-3 TOTAL CP-103-B-0493	46076-3 DISS. CP-103-B-0493	46076-4 TOTAL CP-103-A-0493	46076-4 DISS. CP-103-A-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: May 6, 1993

TO: Burlington Environmental Engineering

PROJECT NAME: Pier 91

PROJECT NUMBER: 624878-7306

LABORATORY NUMBER: 31280

Enclosed are one original and one copy of the Tier III data deliverables package for Laboratory Work Order Number 31280. The samples were received for analysis at Sound Analytical Services, Inc., on April 7, 1993.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,



Andrew J. Riddell
Project Manager

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

April 30, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7306

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 31280

The samples were taken on 4/06/93 and were received at Sound on 4/07/93. The samples were analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons by EPA Method 418.1 modified for soil, and Total Petroleum Fuel Hydrocarbons by EPA Method 8015 modified.

VOLATILE ORGANICS

Samples 31280-1 through 31280-5 were analyzed on 4/12/93. Methylene chloride and acetone were detected in the method blanks at levels above the IDL. Results reported for these compounds in the associated samples were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS

Samples 31280-1 through 31280-4 were extracted on 4/07/93 and analyzed on 4/07/93 and 4/08/93. No compounds were detected in the method blank above the IDL. All QC parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS

Samples 31280-1 through 31280-4 were extracted on 4/12/93 and analyzed on 4/14/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS

Samples 31280-1 through 31280-4 were extracted and analyzed on 4/09/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental, Date: April 15, 1993
Technical Services

Report On: Analysis of Water

Lab No.: 31280

Page 1 of 26

IDENTIFICATION:

Samples received on 04-07-93

Project: 624878-7306 Pier 91

ANALYSIS:

Lab Sample No. 31280-1

Client ID: CP108B-0493

Volatile Organics by Method 8240

Date Analyzed: 4-12-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	ND	5	
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	9.1	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 2 of 26
 Lab No. 31280
 April 15, 1993

Lab Sample No. 31280-1

Client ID: CP108B-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	2.3	5	J
Chlorobenzene	ND	5	
Ethyl Benzene	2.3	5	J
Styrene	ND	5	
Total Xylenes	5.2	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	100	88 - 110	81 - 117
Bromofluorobenzene	97	86 - 115	74 - 121
1,2-Dichloroethane-D4	113	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 3 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-1

Client ID: CP108B-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-9-93

Date Analyzed: 4-12-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	10	
bis(2-Chloroethyl) ether	ND	10	
2-Chlorophenol	ND	10	
1,3-Dichlorobenzene	ND	10	
1,4-Dichlorobenzene	ND	10	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	10	
2-Methylphenol	ND	10	
bis(2-Chloroisopropyl) ether	ND	10	
4-Methylphenol	ND	10	
N-Nitroso-Di-N-propylamine	ND	10	
Hexachloroethane	ND	10	
Nitrobenzene	ND	10	
Isophorone	ND	10	
2-Nitrophenol	ND	10	
2,4-Dimethylphenol	ND	10	
Benzoic Acid	ND	51	
bis(2-Chloroethoxy)methane	ND	10	
2,4-Dichlorophenol	ND	10	
1,2,4-Trichlorobenzene	ND	10	
Naphthalene	ND	10	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	10	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 4 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-1

Client ID: CP108B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	10	
Hexachlorocyclopentadiene	ND	10	
2,4,6-Trichlorophenol	ND	10	
2,4,5-Trichlorophenol	ND	10	
2-Chloronaphthalene	ND	10	
2-Nitroaniline	ND	51	
Dimethyl phthalate	ND	10	
Acenaphthylene	ND	10	
2,6-Dinitrotoluene	ND	10	
3-Nitroaniline	ND	51	
Acenaphthene	ND	10	
2,4-Dinitrophenol	ND	51	
4-Nitrophenol	ND	51	
Dibenzofuran	ND	10	
2,4-Dinitrotoluene	ND	10	
Diethylphthalate	ND	10	
4-Chlorophenyl phenyl ether	ND	10	
Fluorene	ND	10	
4-Nitroaniline	ND	51	
4,6-Dinitro-2-methylphenol	ND	51	
N-Nitrosodiphenylamine	ND	10	
4-Bromophenyl phenyl ether	ND	10	
Hexachlorobenzene	ND	10	
Pentachlorophenol	ND	51	
Phenanthrene	ND	10	
Anthracene	ND	10	
Di-n-butylphthalate	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 5 of 26
 Lab No. 31280
 April 15, 1993

Lab Sample No. 31280-1

Client ID: CP108B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	10	
Pyrene	ND	10	
Butyl benzyl phthalate	ND	10	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	10	
Chrysene	ND	10	
bis(2-ethylhexyl)phthalate	23	10	
Di-n-octyl phthalate	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Indeno(1,2,3-cd)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	66	35 - 114	23 - 120
2-Fluorobiphenyl	58	43 - 116	30 - 115
p-Terphenyl-d ₁₄	54	33 - 141	18 - 137
Phenol-d ₆	11	10 - 94	24 - 113
2-Fluorophenol	44	21 - 100	25 - 121
2,4,6-Tribromophenol	82	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 6 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-1

Client ID: CP108B-0493

TPH Per EPA SW-846 Modified Method 8015

Date Extracted: 4-12-93

Date Analyzed: 4-14-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

SURROGATE RECOVERY, %

1-chlorooctane	80
o-terphenyl	102

TPH Per EPA Method 418.1

Date Extracted: 4-9-93

Date Analyzed: 4-9-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	ND	1.0	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 7 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-2

Client ID: CP108A-0493

Volatile Organics by Method 8240
Date Analyzed: 4-10-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	1.9	5	B1, J
Acetone	1.1	50	B1, J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	2.1	5	J
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 8 of 26
 Lab No. 31280
 April 15, 1993

Lab Sample No. 31280-2

Client ID: CP108A-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	0.83	5	J
Chlorobenzene	ND	5	
Ethyl Benzene	1.2	5	J
Styrene	ND	5	
Total Xylenes	2.2	5	J

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	98	88 - 110	81 - 117
Bromofluorobenzene	99	86 - 115	74 - 121
1,2-Dichloroethane-D4	109	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 9 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-2

Client ID: CP108A-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-9-93

Date Analyzed: 4-12-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.9	
bis(2-Chloroethyl) ether	ND	9.9	
2-Chlorophenol	ND	9.9	
1,3-Dichlorobenzene	ND	9.9	
1,4-Dichlorobenzene	ND	9.9	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	9.9	
2-Methylphenol	ND	9.9	
bis(2-Chloroisopropyl)ether	ND	9.9	
4-Methylphenol	ND	9.9	
N-Nitroso-Di-N-propylamine	ND	9.9	
Hexachloroethane	ND	9.9	
Nitrobenzene	ND	9.9	
Isophorone	ND	9.9	
2-Nitrophenol	ND	9.9	
2,4-Dimethylphenol	ND	9.9	
Benzoic Acid	ND	50	
bis(2-Chloroethoxy)methane	ND	9.9	
2,4-Dichlorophenol	ND	9.9	
1,2,4-Trichlorobenzene	ND	9.9	
Naphthalene	ND	9.9	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	9.9	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 10 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-2

Client ID: CP108A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	9.9	
Hexachlorocyclopentadiene	ND	9.9	
2,4,6-Trichlorophenol	ND	9.9	
2,4,5-Trichlorophenol	ND	9.9	
2-Chloronaphthalene	ND	9.9	
2-Nitroaniline	ND	50	
Dimethyl phthalate	ND	9.9	
Acenaphthylene	ND	9.9	
2,6-Dinitrotoluene	ND	9.9	
3-Nitroaniline	ND	50	
Acenaphthene	ND	9.9	
2,4-Dinitrophenol	ND	50	
4-Nitrophenol	ND	50	
Dibenzofuran	ND	9.9	
2,4-Dinitrotoluene	ND	9.9	
Diethylphthalate	ND	9.9	
4-Chlorophenyl phenyl ether	ND	9.9	
Fluorene	ND	9.9	
4-Nitroaniline	ND	50	
4,6-Dinitro-2-methylphenol	ND	50	
N-Nitrosodiphenylamine	ND	9.9	
4-Bromophenyl phenyl ether	ND	9.9	
Hexachlorobenzene	ND	9.9	
Pentachlorophenol	ND	50	
Phenanthrene	ND	9.9	
Anthracene	ND	9.9	
Di-n-butylphthalate	5.8	9.9	J

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 11 of 26
 Lab No. 31280
 April 15, 1993

Lab Sample No. 31280-2

Client ID: CP108A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.9	J
Pyrene	ND	9.9	
Butyl benzyl phthalate	ND	9.9	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	9.9	
Chrysene	ND	9.9	
bis(2-ethylhexyl)phthalate	1.6	9.9	
Di-n-octyl phthalate	ND	9.9	
Benzo(b)fluoranthene	ND	9.9	
Benzo(k)fluoranthene	ND	9.9	
Benzo(a)pyrene	ND	9.9	
Indeno(1,2,3-cd)pyrene	ND	9.9	
Dibenz(a,h)anthracene	ND	9.9	
Benzo(g,h,i)perylene	ND	9.9	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	62	35 - 114	23 - 120
2-Fluorobiphenyl	55	43 - 116	30 - 115
p-Terphenyl-d ₁₄	60	33 - 141	18 - 137
Phenol-d ₆	24	10 - 94	24 - 113
2-Fluorophenol	44	21 - 100	25 - 121
2,4,6-Tribromophenol	79	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
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Lab No. 31280
April 15, 1993

Lab Sample No. 31280-2

Client ID: CP108A-0493

TPH Per EPA SW-846 Modified Method 8015

Date Extracted: 4-12-93

Date Analyzed: 4-14-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

SURROGATE RECOVERY, %

1-chlorooctane	105
o-terphenyl	112

TPH Per EPA Method 418.1

Date Extracted: 4-9-93

Date Analyzed: 4-9-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	ND	1.0	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 13 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-3

Client ID: CP103B-0493

Volatile Organics by Method 8240
Date Analyzed: 4-10-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	1.2	5	B1, J
Acetone	0.90	50	B1, J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	6.8	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 14 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-3

Client ID: CP103B-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	99	88 - 110	81 - 117
Bromofluorobenzene	97	86 - 115	74 - 121
1,2-Dichloroethane-D4	108	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 15 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-3

Client ID: CP103B-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-9-93

Date Analyzed: 4-12-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	11	
bis(2-Chloroethyl) ether	ND	11	
2-Chlorophenol	ND	11	
1,3-Dichlorobenzene	ND	11	
1,4-Dichlorobenzene	ND	11	
Benzyl Alcohol	ND	21	
1,2-Dichlorobenzene	ND	11	
2-Methylphenol	ND	11	
bis(2-Chloroisopropyl) ether	ND	11	
4-Methylphenol	ND	11	
N-Nitroso-Di-N-propylamine	ND	11	
Hexachloroethane	ND	11	
Nitrobenzene	ND	11	
Isophorone	ND	11	
2-Nitrophenol	ND	11	
2,4-Dimethylphenol	ND	11	
Benzoic Acid	ND	53	
bis(2-Chloroethoxy) methane	ND	11	
2,4-Dichlorophenol	ND	11	
1,2,4-Trichlorobenzene	ND	11	
Naphthalene	ND	11	
4-Chloroaniline	ND	21	
Hexachlorobutadiene	ND	11	
4-Chloro-3-methylphenol	ND	21	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 16 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-3

Client ID: CP103B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	11	
Hexachlorocyclopentadiene	ND	11	
2,4,6-Trichlorophenol	ND	11	
2,4,5-Trichlorophenol	ND	11	
2-Chloronaphthalene	ND	11	
2-Nitroaniline	ND	53	
Dimethyl phthalate	ND	11	
Acenaphthylene	ND	11	
2,6-Dinitrotoluene	ND	11	
3-Nitroaniline	ND	53	
Acenaphthene	ND	11	
2,4-Dinitrophenol	ND	53	
4-Nitrophenol	ND	53	
Dibenzofuran	ND	11	
2,4-Dinitrotoluene	ND	11	
Diethylphthalate	ND	11	
4-Chlorophenyl phenyl ether	ND	11	
Fluorene	ND	11	
4-Nitroaniline	ND	53	
4,6-Dinitro-2-methylphenol	ND	53	
N-Nitrosodiphenylamine	ND	11	
4-Bromophenyl phenyl ether	ND	11	
Hexachlorobenzene	ND	11	
Pentachlorophenol	ND	53	
Phenanthrene	ND	11	
Anthracene	ND	11	
Di-n-butylphthalate	4.4	11	J

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 17 of 26
 Lab No. 31280
 April 15, 1993

Lab Sample No. 31280-3

Client ID: CP103B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	11	
Pyrene	ND	11	
Butyl benzyl phthalate	ND	11	
3,3'-Dichlorobenzidine	ND	21	
Benzo(a)anthracene	ND	11	
Chrysene	ND	11	
bis(2-ethylhexyl)phthalate	11	11	
Di-n-octyl phthalate	ND	11	
Benzo(b)fluoranthene	ND	11	
Benzo(k)fluoranthene	ND	11	
Benzo(a)pyrene	ND	11	
Indeno(1,2,3-cd)pyrene	ND	11	
Dibenz(a,h)anthracene	ND	11	
Benzo(g,h,i)perylene	ND	11	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	67	35 - 114	23 - 120
2-Fluorobiphenyl	56	43 - 116	30 - 115
p-Terphenyl-d ₁₄	58	33 - 141	18 - 137
Phenol-d ₆	23	10 - 94	24 - 113
2-Fluorophenol	47	21 - 100	25 - 121
2,4,6-Tribromophenol	77	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 18 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-3

Client ID: CP103B-0493

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-12-93
Date Analyzed: 4-14-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

SURROGATE RECOVERY, %
1-chlorooctane 95
o-terphenyl 103

TPH Per EPA Method 418.1
Date Extracted: 4-9-93
Date Analyzed: 4-9-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	ND	1.0	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 19 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-4

Client ID: CP103A-0493

Volatile Organics by Method 8240
Date Analyzed: 4-10-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	10	20	J
Methylene Chloride	21	10	B1
Acetone	2.1	100	B1, J
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	ND	10	
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	ND	10	
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 20 of 26
 Lab No. 31280
 April 15, 1993

Lab Sample No. 31280-4

Client ID: CP103A-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	2.2	10	J
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	4.3	10	J
Chlorobenzene	ND	10	
Ethyl Benzene	ND	10	
Styrene	ND	10	
Total Xylenes	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	96	88 - 110	81 - 117
Bromofluorobenzene	99	86 - 115	74 - 121
1,2-Dichloroethane-D4	109	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 21 of 26
 Lab No. 31280
 April 15, 1993

Lab Sample No. 31280-4

Client ID: CP103A-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-9-93

Date Analyzed: 4-12-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.9	J
bis(2-Chloroethyl) ether	ND	9.9	
2-Chlorophenol	ND	9.9	
1,3-Dichlorobenzene	ND	9.9	
1,4-Dichlorobenzene	ND	9.9	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	9.9	
2-Methylphenol	ND	9.9	
bis(2-Chloroisopropyl)ether	ND	9.9	
4-Methylphenol	5.3	9.9	
N-Nitroso-Di-N-propylamine	ND	9.9	
Hexachloroethane	ND	9.9	
Nitrobenzene	ND	9.9	
Isophorone	ND	9.9	
2-Nitrophenol	ND	9.9	
2,4-Dimethylphenol	ND	9.9	
Benzoic Acid	ND	50	
bis(2-Chloroethoxy)methane	ND	9.9	
2,4-Dichlorophenol	ND	9.9	
1,2,4-Trichlorobenzene	ND	9.9	
Naphthalene	ND	9.9	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	9.9	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 22 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-4

Client ID: CP103A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	9.9	
Hexachlorocyclopentadiene	ND	9.9	
2,4,6-Trichlorophenol	ND	9.9	
2,4,5-Trichlorophenol	ND	9.9	
2-Chloronaphthalene	ND	9.9	
2-Nitroaniline	ND	50	
Dimethyl phthalate	ND	9.9	
Acenaphthylene	ND	9.9	
2,6-Dinitrotoluene	ND	9.9	
3-Nitroaniline	ND	50	
Acenaphthene	ND	9.9	
2,4-Dinitrophenol	ND	50	
4-Nitrophenol	ND	50	
Dibenzofuran	ND	9.9	
2,4-Dinitrotoluene	ND	9.9	
Diethylphthalate	ND	9.9	
4-Chlorophenyl phenyl ether	ND	9.9	
Fluorene	ND	9.9	
4-Nitroaniline	ND	50	
4,6-Dinitro-2-methylphenol	ND	50	
N-Nitrosodiphenylamine	ND	9.9	
4-Bromophenyl phenyl ether	ND	9.9	
Hexachlorobenzene	ND	9.9	
Pentachlorophenol	ND	50	
Phenanthrene	ND	9.9	
Anthracene	ND	9.9	
Di-n-butylphthalate	4.7	9.9	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 23 of 26
 Lab No. 31280
 April 15, 1993

Lab Sample No. 31280-4

Client ID: CP103A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.9	J
Pyrene	ND	9.9	
Butyl benzyl phthalate	ND	9.9	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	9.9	
Chrysene	ND	9.9	
bis(2-ethylhexyl)phthalate	1.8	9.9	
Di-n-octyl phthalate	ND	9.9	
Benzo(b)fluoranthene	ND	9.9	
Benzo(k)fluoranthene	ND	9.9	
Benzo(a)pyrene	ND	9.9	
Indeno(1,2,3-cd)pyrene	ND	9.9	
Dibenz(a,h)anthracene	ND	9.9	
Benzo(g,h,i)perylene	ND	9.9	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	49	35 - 114	23 - 120
2-Fluorobiphenyl	53	43 - 116	30 - 115
p-Terphenyl-d ₁₄	56	33 - 141	18 - 137
Phenol-d ₆	22	10 - 94	24 - 113
2-Fluorophenol	38	21 - 100	25 - 121
2,4,6-Tribromophenol	67	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 24 of 26
Lab No. 31280
April 15, 1993

Lab Sample No. 31280-4

Client ID: CP103A-0493

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-12-93
Date Analyzed: 4-14-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	91
o-terphenyl	98

TPH Per EPA Method 418.1
Date Extracted: 4-9-93
Date Analyzed: 4-9-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	ND	1.0	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

DATA QUALIFIER FLAGS

- ND: Indicates that the analyte was analyzed for but was not detected. The associated numerical value is the practical quantitation limit, corrected for sample dilution.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- C: The identification of this analyte was confirmed by GC/MS.
- B1: This analyte was also detected in the associated method blank. The reported sample results have been adjusted for moisture, final extract volume, and/or dilutions performed during extract preparation. The analyte concentration was evaluated prior to sample preparation adjustments, and was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was also detected in the associated method blank. However, the analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- E: The concentration of this analyte exceeded the instrument calibration range.
- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- A: This TIC is a suspected aldol-condensation product.
- M: Quantitation Limits are elevated due to matrix interferences.
- S: The calibration quality control criteria for this compound were not met. The reported concentration should be considered an estimated quantity.
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.
- X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.
- X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.
- X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results. Sample matrix is nonhomogeneous.
- X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike was diluted out during analysis.
- X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: RPD value for MS/MSD outside QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside QC limits due to matrix composition.
- X10: Surrogate recovery outside QC limits due to high contaminant levels.

CHAIN OF CUSTODY



CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6225

[illegible]

RELINQUISHED BY

RECEIVED BY

SIGNATURE		DATE	TIME	SIGNATURE		DATE	TIME
<i>[Signature]</i>		4-6-93	1645	<i>[Signature]</i>		4-7-93	9:30 A
<i>[Signature]</i>		4-7-93	12:20 P	<i>[Signature]</i>		4/7/93	9:30 A
SHIPPING NOTES <i>Picked up By Sound Analytical Courier</i>				LAB NOTES			



BURLINGTON ENVIRONMENTAL

RECEIVED

MAY 10 1993

May 10, 1993

Burlington Environmental Inc.
Technical Services

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46145

Dear Joe:

Two water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 8, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report.

The analyst(s) name(s) and the instrument used for each analyte are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure



BURLINGTON
ENVIRONMENTAL

General Laboratory Report

Lab Number : 46145

Plant/Generator Name : Pier 91; Project #624878 TASK 7306

Sample Type : Groundwater; CP-107-0493 and CP-106A-0493

Date of Receipt : 04/08/93 Analyst: BLW, BB, EL

Date of Report : 05/10/93 QC Checked: *Kathy Greps*

Parameters for Analysis: Total and Dissolved Metals

Outside Lab : None Outside Lab Report No:

Data:

These two groundwater samples from the Pier 91 Project #624878, Task 7306, sample numbers CP-107-0493 and CP-106A-0493, were analyzed for Total and Dissolved Metals by Methods 7000 and 6010. Copies of the results are attached.

Comments and Conclusions:



CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6320

[illegible]

RELINQUISHED BY

RECEIVED BY

SIGNATURE		DATE	TIME	SIGNATURE		DATE	TIME
David Butler		4-8-93	16:30	[Signature]		4/8/93	4:30p
SHIPPING NOTES				LAB NOTES			

Metals Laboratory Report

Lab Number : 46145

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/08/93

Analyst: BLW, BB, EL

Date of Report : 04/23/93

QC Checked: *ASB/MLW 4/23/93*

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab : NONE

Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	46145-1 TOTAL	46145-1 DISS.	46145-2 TOTAL	46145-2 DISS.
Metals:	CP-107-0493	CP-107-0493	CP-106A-0493	CP-106A-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

DATES ANALYZED: 4/14/93, 4/20/93, 4/21/93, 4/22/93

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

RECEIVED

MAY 14 1993

Burlington Environmental Inc.
Technical Services

DATE: May 12, 1993

TO: David Broten, Burlington Environmental Engineering

PROJECT NAME: Pier 91

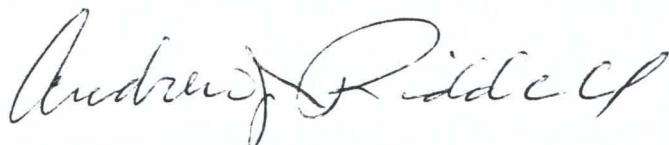
PROJECT NUMBER: 624878-7306

LABORATORY NUMBER: 31340

Enclosed are one original and one copy of the Tier II data deliverables package for Laboratory Work Order Number 31340. The samples were received for analysis at Sound Analytical Services, Inc., on April 9, 1993.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,



Andrew J. Riddell
Project Manager

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

May 12, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7306

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 31340

The samples were taken on 4/08/93 and were received at Sound on 4/09/93. The samples were analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons by EPA Method 418.1 modified for soil, and Total Petroleum Fuel Hydrocarbons by EPA Method 8015 modified. One oil sample was qualitatively screened for total petroleum fuel hydrocarbons in accordance with WA State DOE Method WTPH-HCID. The density of the oil sample was determined in accordance with Standard Methods for the Examination of Water and Wastewater (16th Ed.) Method 213 E.

VOLATILE ORGANICS

Samples 31340-1 through 31340-3 were analyzed on 4/16/93 and 4/19/93. Methylene chloride was detected in the method blanks at levels above the IDL. Results reported for methylene chloride in the associated samples were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS

Samples 31340-1 and 31340-2 were extracted on 4/15/93 and analyzed on 4/16/93. No compounds were detected in the method blank above the IDL. All QC parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS

Samples 31340-1 and 31340-2 were extracted on 4/12/93 and analyzed on 4/13/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS

Samples 31340-1 and 31340-2 were extracted on 4/12/93 and analyzed on 4/13/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

HYDROCARBON IDENTIFICATION

Sample 31340-1 was extracted on 4/16/93 and analyzed on 4/20/93. No contamination above the PQL was present in the method blank.

SPECIFIC GRAVITY

The specific gravity for sample 31340-1 was determined on 4/13/93.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental, Date: April 23, 1993
Technical Services

Report On: Analysis of Oil & Water Lab No.: 31340
Page 1 of 15

IDENTIFICATION:

Samples received on 04-09-93
Project: 624878-7306 Pier 91

ANALYSIS:

Lab Sample No. 31340-1

Client ID: CP-107-0493

Volatile Organics by Method 8240
Date Analyzed: 4-19-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	55	20	
Methylene Chloride	42	10	B1
Acetone	11	100	J
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	2.6	10	J
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	ND	10	
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services

Project: 624878-7306 Pier 91

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Lab No. 31340

April 22, 1993

Lab Sample No. 31340-1

Client ID: CP-107-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	10	
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	ND	10	
Chlorobenzene	ND	10	
Ethyl Benzene	ND	10	
Styrene	ND	10	
Total Xylenes	4.0	10	J

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	103	88 - 110	81 - 117
Bromofluorobenzene	86	86 - 115	74 - 121
1,2-Dichloroethane-D4	110	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 3 of 15
Lab No. 31340
April 22, 1993

Lab Sample No. 31340-1

Client ID: CP-107-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-15-93

Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.9	
bis(2-Chloroethyl) ether	ND	9.9	
2-Chlorophenol	ND	9.9	
1,3-Dichlorobenzene	ND	9.9	
1,4-Dichlorobenzene	ND	9.9	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	9.9	
2-Methylphenol	ND	9.9	
bis(2-Chloroisopropyl) ether	ND	9.9	
4-Methylphenol	ND	9.9	
N-Nitroso-Di-N-propylamine	ND	9.9	
Hexachloroethane	ND	9.9	
Nitrobenzene	ND	9.9	
Isophorone	ND	9.9	
2-Nitrophenol	ND	9.9	
2,4-Dimethylphenol	ND	9.9	
Benzoic Acid	ND	50	
bis(2-Chloroethoxy) methane	ND	9.9	
2,4-Dichlorophenol	ND	9.9	
1,2,4-Trichlorobenzene	ND	9.9	
Naphthalene	ND	9.9	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	9.9	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 4 of 15
Lab No. 31340
April 22, 1993

Lab Sample No. 31340-1

Client ID: CP-107-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	3.6	9.9	J
Hexachlorocyclopentadiene	ND	9.9	
2,4,6-Trichlorophenol	ND	9.9	
2,4,5-Trichlorophenol	ND	9.9	
2-Chloronaphthalene	ND	9.9	
2-Nitroaniline	ND	50	
Dimethyl phthalate	ND	9.9	
Acenaphthylene	ND	9.9	
2,6-Dinitrotoluene	ND	9.9	
3-Nitroaniline	ND	50	
Acenaphthene	4.0	9.9	J
2,4-Dinitrophenol	ND	50	
4-Nitrophenol	ND	50	
Dibenzofuran	1.8	9.9	J
2,4-Dinitrotoluene	ND	9.9	
Diethylphthalate	ND	9.9	
4-Chlorophenyl phenyl ether	ND	9.9	
Fluorene	7.6	9.9	J
4-Nitroaniline	ND	50	
4,6-Dinitro-2-methylphenol	ND	50	
N-Nitrosodiphenylamine	ND	9.9	
4-Bromophenyl phenyl ether	ND	9.9	
Hexachlorobenzene	ND	9.9	
Pentachlorophenol	ND	50	
Phenanthrene	3.4	9.9	J
Anthracene	ND	9.9	
Di-n-butylphthalate	6.0	9.9	J

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 5 of 15
 Lab No. 31340
 April 22, 1993

Lab Sample No. 31340-1

Client ID: CP-107-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.9	
Pyrene	ND	9.9	
Butyl benzyl phthalate	ND	9.9	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	9.9	
Chrysene	ND	9.9	
bis(2-ethylhexyl)phthalate	ND	9.9	
Di-n-octyl phthalate	ND	9.9	
Benzo(b)fluoranthene	ND	9.9	
Benzo(k)fluoranthene	ND	9.9	
Benzo(a)pyrene	ND	9.9	
Indeno(1,2,3-cd)pyrene	ND	9.9	
Dibenz(a,h)anthracene	ND	9.9	
Benzo(g,h,i)perylene	ND	9.9	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	69	35 - 114	23 - 120
2-Fluorobiphenyl	64	43 - 116	30 - 115
p-Terphenyl-d ₁₄	74	33 - 141	18 - 137
Phenol-d ₆	24	10 - 94	24 - 113
2-Fluorophenol	47	21 - 100	25 - 121
2,4,6-Tribromophenol	86	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 6 of 15
Lab No. 31340
April 22, 1993

Lab Sample No. 31340-1

Client ID: CP-107-0493

TPH Per EPA Method 418.1
Date Extracted: 4-12-93
Date Analyzed: 4-13-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	3.5	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-12-93
Date Analyzed: 4-14-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons, mg/L	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	87
o-terphenyl	98

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 7 of 15
Lab No. 31340
April 22, 1993

Lab Sample No. 31340-1
Matrix: Oil

Client ID: CP-107-0493

WTPH-HCID
Date Extracted: 4-16-93
Date Analyzed: 4-20-93

<u>Parameters</u>	<u>Concentration, mg/kg</u>	<u>Flag</u>
Gasoline (C7 - C12)	> 20	
Diesel (> C12 - C24)	> 50	
Heavy Oil (C24+)	< 100	

SURROGATE RECOVERY, %

1-chlorooctane	X10
o-terphenyl	X10

ND - Not Detected
PQL - Practical Quantitation Limit

<u>Parameter</u>	<u>Result</u>
Specific Gravity	0.866

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 8 of 15
Lab No. 31340
April 22, 1993

Lab Sample No. 31340-2

Client ID: CP-106A-0493

Volatile Organics by Method 8240
Date Analyzed: 4-19-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	B1
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	ND	20	
Methylene Chloride	24	10	
Acetone	ND	100	
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	ND	10	
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	J
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	1.8	10	
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 9 of 15
Lab No. 31340
April 22, 1993

Lab Sample No. 31340-2

Client ID: CP-106A-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	10	
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	ND	10	
Chlorobenzene	ND	10	
Ethyl Benzene	ND	10	
Styrene	ND	10	
Total Xylenes	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	104	88 - 110	81 - 117
Bromofluorobenzene	90	86 - 115	74 - 121
1,2-Dichloroethane-D4	106	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 10 of 15
Lab No. 31340
April 22, 1993

Lab Sample No. 31340-2

Client ID: CP-106A-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-15-93

Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.8	
bis(2-Chloroethyl) ether	ND	9.8	
2-Chlorophenol	ND	9.8	
1,3-Dichlorobenzene	ND	9.8	
1,4-Dichlorobenzene	ND	9.8	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	9.8	
2-Methylphenol	ND	9.8	
bis(2-Chloroisopropyl) ether	ND	9.8	
4-Methylphenol	ND	9.8	
N-Nitroso-Di-N-propylamine	ND	9.8	
Hexachloroethane	ND	9.8	
Nitrobenzene	ND	9.8	
Isophorone	ND	9.8	
2-Nitrophenol	ND	9.8	
2,4-Dimethylphenol	ND	9.8	
Benzoic Acid	ND	49	
bis(2-Chloroethoxy) methane	ND	9.8	
2,4-Dichlorophenol	ND	9.8	
1,2,4-Trichlorobenzene	ND	9.8	
Naphthalene	ND	9.8	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	9.8	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 11 of 15
Lab No. 31340
April 22, 1993

Lab Sample No. 31340-2

Client ID: CP-106A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	9.8	
Hexachlorocyclopentadiene	ND	9.8	
2,4,6-Trichlorophenol	ND	9.8	
2,4,5-Trichlorophenol	ND	9.8	
2-Chloronaphthalene	ND	9.8	
2-Nitroaniline	ND	49	
Dimethyl phthalate	ND	9.8	
Acenaphthylene	ND	9.8	
2,6-Dinitrotoluene	ND	9.8	
3-Nitroaniline	ND	49	
Acenaphthene	ND	9.8	
2,4-Dinitrophenol	ND	49	
4-Nitrophenol	ND	49	
Dibenzofuran	ND	9.8	
2,4-Dinitrotoluene	ND	9.8	
Diethylphthalate	ND	9.8	
4-Chlorophenyl phenyl ether	ND	9.8	
Fluorene	ND	9.8	
4-Nitroaniline	ND	49	
4,6-Dinitro-2-methylphenol	ND	49	
N-Nitrosodiphenylamine	ND	9.8	
4-Bromophenyl phenyl ether	ND	9.8	
Hexachlorobenzene	ND	9.8	
Pentachlorophenol	ND	49	
Phenanthrene	ND	9.8	
Anthracene	ND	9.8	
Di-n-butylphthalate	4.2	9.8	J

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 12 of 15
 Lab No. 31340
 April 22, 1993

Lab Sample No. 31340-2

Client ID: CP-106A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.8	J
Pyrene	ND	9.8	
Butyl benzyl phthalate	ND	9.8	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	9.8	
Chrysene	ND	9.8	
bis(2-ethylhexyl)phthalate	2.8	9.8	
Di-n-octyl phthalate	ND	9.8	
Benzo(b)fluoranthene	ND	9.8	
Benzo(k)fluoranthene	ND	9.8	
Benzo(a)pyrene	ND	9.8	
Indeno(1,2,3-cd)pyrene	ND	9.8	
Dibenz(a,h)anthracene	ND	9.8	
Benzo(g,h,i)perylene	ND	9.8	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	70	35 - 114	23 - 120
2-Fluorobiphenyl	60	43 - 116	30 - 115
p-Terphenyl-d ₁₄	73	33 - 141	18 - 137
Phenol-d ₆	23	10 - 94	24 - 113
2-Fluorophenol	48	21 - 100	25 - 121
2,4,6-Tribromophenol	79	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 13 of 15
Lab No. 31340
April 22, 1993

Lab Sample No. 31340-2

Client ID: CP-106A-0493

TPH Per EPA Method 418.1
Date Extracted: 4-12-93
Date Analyzed: 4-13-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	1.8	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-12-93
Date Analyzed: 4-14-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons, mg/L	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	70
o-terphenyl	101

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

DATA QUALIFIER FLAGS

- ND: Indicates that the analyte was analyzed for but was not detected. The associated numerical value is the practical quantitation limit, corrected for sample dilution.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- C: The identification of this analyte was confirmed by GC/MS.
- B1: This analyte was also detected in the associated method blank. The reported sample results have been adjusted for moisture, final extract volume, and/or dilutions performed during extract preparation. The analyte concentration was evaluated prior to sample preparation adjustments, and was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was also detected in the associated method blank. However, the analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- E: The concentration of this analyte exceeded the instrument calibration range.
- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- A: This TIC is a suspected aldol-condensation product.
- M: Quantitation Limits are elevated due to matrix interferences.
- S: The calibration quality control criteria for this compound were not met. The reported concentration should be considered an estimated quantity.
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.
- X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.
- X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.
- X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results. Sample matrix is nonhomogeneous.
- X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike was diluted out during analysis.
- X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: RPD value for MS/MSD outside QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside QC limits due to matrix composition.
- X10: Surrogate recovery outside QC limits due to high contaminant levels.



210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

C.O.C. SERIAL NO. 6322

an

RELINQUISHED BY

RECEIVED BY _____

SIGNATURE		DATE	TIME	SIGNATURE		DATE	TIME
<i>[Signature]</i>		4-8-93	1630	<i>[Signature]</i>		4-9-93	19:55A
<i>[Signature]</i>		4-9-93	12:35P	<i>[Signature]</i>		4/9/93	12:35
SHIPPING NOTES				LAB NOTES			



BURLINGTON ENVIRONMENTAL

RECEIVED

MAY 10 1993

May 10, 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Burlington Environmental Inc.
Technical Services

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46175

Dear Joe:

Six water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 12, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals and PCBs at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report. The PCBs were extracted and analyzed in batches. These dates are tabulated below. All PCB surrogates recovered between 50% and 150%, except sample 46175-5 which had a TCMX recovery of 35% due to an interfering peak.

Laboratory Number(s)	GC Run Number(s)	Date(s) Extracted	Date(s) Analyzed
46175-1,2,3,4,5,6, M04123-3, and B04123-3	AAKZ, CAFX, and CAFW	4/12/93	4/13/93, 4/23/93 and 4/27/93

The analyst(s) name(s) and the instrument used for each analyte are specified on the PCB report and are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure



BURLINGTON
ENVIRONMENTAL

General Laboratory Report

Lab Number : 46175

Plant/Generator Name : Pier 91; Project #624878 TASK 7306

Sample Type : Groundwater; CP-106B,-115A,-115B,-915A,-122B,-115M

Date of Receipt : 04/12/93 Analyst: BLW,BB,EL,JB,DW

Date of Report : 05/10/93 QC Checked: *Kelly O'Leary*

Parameters for Analysis: PCBs, Total and Dissolved Metals

Outside Lab : None Outside Lab Report No:

Data:

These six groundwater samples from Pier 91 Project #624878, Task 7306, sample numbers CP-106B-0493, CP-115A-0493, CP-115B-0493, CP-915A-0493, CP-122B-0493, CP-115M-0493 were analyzed for PCBs by Method 8080 and for Total and Dissolved Metals by Methods 7000 and 6010. Copies of all results are attached.

Comments and Conclusions:



**BURLINGTON
ENVIRONMENTAL**

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6324

[illegible]

RELINQUISHED BY

RECEIVED BY

~~SIGNATURE~~

DATE _____

TIME

SIGNATURE

DATE _____

TIME

SHIPPING NOTES

LAB NOTES

PCB Laboratory Report

Page 1

Lab Number : 46175

Plant/Generator Name : / PIER 91 Pj# 624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/12/93

Analyst: BLW, BB, EL, JB, DW

Date of Report : 04/29/93

QC Checked: OK 5/3/93

Outside Lab : NONE

Outside Lab Report No:

Number of Samples :

<u>Run #</u>	<u>Sample ID</u>	<u>Code Numbers</u>	<u># Drums in Composite</u>	<u>Aroclor #</u>	<u>Total PCB (ppm)</u>
AAKZ43	B04123-3	BLANK			<0.1ppb
AAKZ42	M04123-3	METHOD SPIKE		1248	130%
CAFX17	46175-1	CP-106B-0493			<1.0ppb
CAFW28	46175-2	CP-115A-0493			<0.1ppb
CAFX18	46175-3	CP-115B-0493			<1.0ppb
CAFW30	46175-4	CP-915A-0493			<0.1ppb
CAFX28	46175-5	CP-122B-0493			<10ppb
AAKZ39	46175-6	CP-115M-0493			<0.1ppb
AAKZ41	CCV	5 PPM CCV (111%)		1254	5.56
)			
AAKZ50	CCV	5 PPM CCV (112%)		1248	5.61
)			
AAKZ30	CCV	5 PPM CCV (111%)		1248	5.56
)			
CAFX15	CCV	5 PPM CCV (101%)		1248	5.04
)			
CAFX26	CCV	5 PPM CCV (110%)		1248	5.49
)			
CAFX37	CCV	5 PPM CCV (111%)		1254	5.55
)			
CAFW26	CCV	5 PPM CCV (92%)		1260	4.60
CAFW37	CCV	5 PPM CCV (104%)		1254	5.18
)			

Instruments: Hewlett Packard 5890 and 5890 Series II G.C.s

Analysts: Al Flores-Serrano and Della Kay Wilson

Metals Laboratory Report

Lab Number : 46175

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/12/93 Analyst: BLW, BB, EL, JB

Date of Report : 04/22/93 QC Checked: *[Signature]* 4/23/93

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	46175-1 TOTAL	46175-1 DISS.	46175-2 TOTAL	46175-2 DISS.
Metals:	CP-106-B-0493	CP-106-B-0493	CP-115A-0493	CP-115A-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	0.019	0.011	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.006	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

DATES ANALYZED: 4/15/93, 4/17/93, 4/19/93, 4/20/93
4/21/93, 4/22/93.

Metals Laboratory Report

Lab Number : 46175

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/12/93

Analyst: BLW, BB, EL, JB

Date of Report : 04/22/93

QC Checked: *[Signature]* 4/23/93

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab : NONE

Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	46175-3 TOTAL	46175-3 DISS.	46175-4 TOTAL	46175-4 DISS.
Metals:	CP-115B-0493	CP-115B-0493	CP-915A-0493	CP-915A-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	0.040	0.011	0.010	0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	0.040	<0.040	<0.040	<0.040
Lead	0.005	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	0.048	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

Metals Laboratory Report

Lab Number : 46175
Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/12/93 Analyst: BLW, BB, EL, JB
Date of Report : 04/22/93 QC Checked: *[Signature]*
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	46175-5 TOTAL	46175-5 DISS.	46175-6 TOTAL	46175-6 DISS.
Metals:	CP-122B-0493	CP-122B-0493	CP-115M-0493	CP-115M-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	0.033	0.012	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.012	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	0.023	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

RECEIVED

MAY 17 1993

Burlington Environmental Inc.
Technical Services

DATE: May 13, 1993

TO: David Broten, Burlington Environmental Engineering

PROJECT NAME: Pier 91

PROJECT NUMBER: 624878-7306

LABORATORY NUMBER: 31367

Enclosed are one original and one copy of the Tier II data deliverables package for Laboratory Work Order Number 31367. The samples were received for analysis at Sound Analytical Services, Inc., on April 12, 1993.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,



Andrew J. Riddell
Project Manager

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

May 13, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7306

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 31367

The samples were taken on 4/09/93 and were received at Sound on 4/12/93. The samples were analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons by EPA Method 418.1 modified for soil, and Total Petroleum Fuel Hydrocarbons by EPA Method 8015 modified.

VOLATILE ORGANICS

Samples 31367-1 through 31367-7 were analyzed on 4/16/93. Methylene chloride was detected in the method blank at a level above the IDL. Results reported for this compound in the associated samples were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS

Samples 31367-1 through 31367-6 were extracted on 4/15/93 and analyzed on 4/15/93 and 4/16/93. No compounds were detected in the method blank above the IDL. All QC parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS

Samples 31367-1 through 31367-6 were extracted and analyzed on 4/15/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS

Samples 31367-1 through 31367-6 were extracted on 4/14/93 and analyzed on 4/15/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental, Date: April 20, 1993
Technical Services

Report On: Analysis of Water

Lab No.: 31367

Page 1 of 38

IDENTIFICATION:

Samples received on 04-12-93

Project: 624878-7306 Pier 91

ANALYSIS:

Lab Sample No. 31367-1

Client ID: CP-115M-0493

Volatile Organics by Method 8240

Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	B1
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	0.43	5	
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	J
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	1.5	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 2 of 38
 Lab No. 31367
 April 20, 1993

Lab Sample No. 31367-1

Client ID: CP-115M-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	100	88 - 110	81 - 117
Bromofluorobenzene	87	86 - 115	74 - 121
1,2-Dichloroethane-D4	105	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 3 of 38
Lab No. 31367
April 20, 1993

Lab Sample No. 31367-1

Client ID: CP-115M-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-15-93

Date Analyzed: 4-15-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.6	
bis(2-Chloroethyl) ether	ND	9.6	
2-Chlorophenol	ND	9.6	
1,3-Dichlorobenzene	ND	9.6	
1,4-Dichlorobenzene	ND	9.6	
Benzyl Alcohol	ND	19	
1,2-Dichlorobenzene	ND	9.6	
2-Methylphenol	ND	9.6	
bis(2-Chloroisopropyl)ether	ND	9.6	
4-Methylphenol	ND	9.6	
N-Nitroso-Di-N-propylamine	ND	9.6	
Hexachloroethane	ND	9.6	
Nitrobenzene	ND	9.6	
Isophorone	ND	9.6	
2-Nitrophenol	ND	9.6	
2,4-Dimethylphenol	ND	9.6	
Benzoic Acid	ND	48	
bis(2-Chloroethoxy)methane	ND	9.6	
2,4-Dichlorophenol	ND	9.6	
1,2,4-Trichlorobenzene	ND	9.6	
Naphthalene	ND	9.6	
4-Chloroaniline	ND	19	
Hexachlorobutadiene	ND	9.6	
4-Chloro-3-methylphenol	ND	19	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 4 of 38
Lab No. 31367
April 20, 1993

Lab Sample No. 31367-1

Client ID: CP-115M-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	9.6	
Hexachlorocyclopentadiene	ND	9.6	
2,4,6-Trichlorophenol	ND	9.6	
2,4,5-Trichlorophenol	ND	9.6	
2-Chloronaphthalene	ND	9.6	
2-Nitroaniline	ND	48	
Dimethyl phthalate	ND	9.6	
Acenaphthylene	ND	9.6	
2,6-Dinitrotoluene	ND	9.6	
3-Nitroaniline	ND	48	
Acenaphthene	ND	9.6	
2,4-Dinitrophenol	ND	48	
4-Nitrophenol	ND	48	
Dibenzofuran	ND	9.6	
2,4-Dinitrotoluene	ND	9.6	
Diethylphthalate	ND	9.6	
4-Chlorophenyl phenyl ether	ND	9.6	
Fluorene	ND	9.6	
4-Nitroaniline	ND	48	
4,6-Dinitro-2-methylphenol	ND	48	
N-Nitrosodiphenylamine	ND	9.6	
4-Bromophenyl phenyl ether	ND	9.6	
Hexachlorobenzene	ND	9.6	
Pentachlorophenol	ND	48	
Phenanthrene	ND	9.6	
Anthracene	ND	9.6	
Di-n-butylphthalate	ND	9.6	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 5 of 38
 Lab No. 31367
 April 20, 1993

Lab Sample No. 31367-1

Client ID: CP-115M-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.6	
Pyrene	ND	9.6	
Butyl benzyl phthalate	ND	9.6	
3,3'-Dichlorobenzidine	ND	19	
Benzo(a)anthracene	ND	9.6	
Chrysene	ND	9.6	
bis(2-ethylhexyl)phthalate	ND	9.6	
Di-n-octyl phthalate	ND	9.6	
Benzo(b)fluoranthene	ND	9.6	
Benzo(k)fluoranthene	ND	9.6	
Benzo(a)pyrene	ND	9.6	
Indeno(1,2,3-cd)pyrene	ND	9.6	
Dibenz(a,h)anthracene	ND	9.6	
Benzo(g,h,i)perylene	ND	9.6	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	70	35 - 114	23 - 120
2-Fluorobiphenyl	57	43 - 116	30 - 115
p-Terphenyl-d ₁₄	71	33 - 141	18 - 137
Phenol-d ₆	24	10 - 94	24 - 113
2-Fluorophenol	46	21 - 100	25 - 121
2,4,6-Tribromophenol	72	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 6 of 38
Lab No. 31367
April 20, 1993

Lab Sample No. 31367-1

Client ID: CP-115M-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-15-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	114
o-terphenyl	119

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 7 of 38
Lab No. 31367
April 20, 1993

Lab Sample No. 31367-2

Client ID: CP-106B-0493

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	ND	20	
Methylene Chloride	54	10	B1
Acetone	2.3	100	J
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	ND	10	
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	ND	10	
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 8 of 38
Lab No. 31367
April 20, 1993

Lab Sample No. 31367-2

Client ID: CP-106B-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	10	
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	ND	10	
Chlorobenzene	ND	10	
Ethyl Benzene	ND	10	
Styrene	ND	10	
Total Xylenes	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	103	88 - 110	81 - 117
Bromofluorobenzene	91	86 - 115	74 - 121
1,2-Dichloroethane-D4	103	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 9 of 38
Lab No. 31367
April 20, 1993

Lab Sample No. 31367-2

Client ID: CP-106B-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-15-93

Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	10	
bis(2-Chloroethyl) ether	ND	10	
2-Chlorophenol	ND	10	
1,3-Dichlorobenzene	ND	10	
1,4-Dichlorobenzene	ND	10	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	10	
2-Methylphenol	ND	10	
bis(2-Chloroisopropyl) ether	ND	10	
4-Methylphenol	ND	10	
N-Nitroso-Di-N-propylamine	ND	10	
Hexachloroethane	ND	10	
Nitrobenzene	ND	10	
Isophorone	ND	10	
2-Nitrophenol	ND	10	
2,4-Dimethylphenol	ND	10	
Benzoic Acid	ND	50	
bis(2-Chloroethoxy)methane	ND	10	
2,4-Dichlorophenol	ND	10	
1,2,4-Trichlorobenzene	ND	10	
Naphthalene	ND	10	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	10	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 10 of 38
Lab No. 31367
April 20, 1993

Lab Sample No. 31367-2

Client ID: CP-106B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	10	
Hexachlorocyclopentadiene	ND	10	
2,4,6-Trichlorophenol	ND	10	
2,4,5-Trichlorophenol	ND	10	
2-Chloronaphthalene	ND	10	
2-Nitroaniline	ND	50	
Dimethyl phthalate	ND	10	
Acenaphthylene	ND	10	
2,6-Dinitrotoluene	ND	10	
3-Nitroaniline	ND	50	
Acenaphthene	ND	10	
2,4-Dinitrophenol	ND	50	
4-Nitrophenol	ND	50	
Dibenzofuran	ND	10	
2,4-Dinitrotoluene	ND	10	
Diethylphthalate	ND	10	
4-Chlorophenyl phenyl ether	ND	10	
Fluorene	ND	10	
4-Nitroaniline	ND	50	
4,6-Dinitro-2-methylphenol	ND	50	
N-Nitrosodiphenylamine	ND	10	
4-Bromophenyl phenyl ether	ND	10	
Hexachlorobenzene	ND	10	
Pentachlorophenol	ND	50	
Phenanthrene	ND	10	
Anthracene	ND	10	
Di-n-butylphthalate	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab Sample No. 31367-2

Client ID: CP-106B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	10	
Pyrene	ND	10	
Butyl benzyl phthalate	ND	10	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	10	
Chrysene	ND	10	
bis(2-ethylhexyl)phthalate	ND	10	
Di-n-octyl phthalate	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Indeno(1,2,3-cd)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	79	35 - 114	23 - 120
2-Fluorobiphenyl	65	43 - 116	30 - 115
p-Terphenyl-d ₁₄	68	33 - 141	18 - 137
Phenol-d ₆	18	10 - 94	24 - 113
2-Fluorophenol	46	21 - 100	25 - 121
2,4,6-Tribromophenol	97	10 - 123	19 - 122

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SOUND ANALYTICAL SERVICES, INC.

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April 20, 1993

Lab Sample No. 31367-2

Client ID: CP-106B-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-15-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	114
o-terphenyl	114

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31367
April 20, 1993

Lab Sample No. 31367-3

Client ID: CP-115A-0493

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	B1, J J
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	2.9	5	
Acetone	4.3	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

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SOUND ANALYTICAL SERVICES, INC.

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Lab Sample No. 31367-3

Client ID: CP-115A-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	103	88 - 110	81 - 117
Bromofluorobenzene	93	86 - 115	74 - 121
1,2-Dichloroethane-D4	104	76 - 114	70 - 121

Continued

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Lab Sample No. 31367-3

Client ID: CP-115A-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-15-93

Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	98	
bis(2-Chloroethyl) ether	ND	98	
2-Chlorophenol	ND	98	
1,3-Dichlorobenzene	ND	98	
1,4-Dichlorobenzene	ND	98	
Benzyl Alcohol	ND	200	
1,2-Dichlorobenzene	ND	98	
2-Methylphenol	ND	98	
bis(2-Chloroisopropyl) ether	ND	98	
4-Methylphenol	ND	98	
N-Nitroso-Di-N-propylamine	ND	98	
Hexachloroethane	ND	98	
Nitrobenzene	ND	98	
Isophorone	ND	98	
2-Nitrophenol	ND	98	
2,4-Dimethylphenol	ND	98	
Benzoic Acid	ND	490	
bis(2-Chloroethoxy) methane	ND	98	
2,4-Dichlorophenol	ND	98	
1,2,4-Trichlorobenzene	ND	98	
Naphthalene	ND	98	
4-Chloroaniline	ND	200	
Hexachlorobutadiene	ND	98	
4-Chloro-3-methylphenol	ND	200	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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April 20, 1993

Lab Sample No. 31367-3

Client ID: CP-115A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	98	
Hexachlorocyclopentadiene	ND	98	
2,4,6-Trichlorophenol	ND	98	
2,4,5-Trichlorophenol	ND	98	
2-Chloronaphthalene	ND	98	
2-Nitroaniline	ND	490	
Dimethyl phthalate	ND	98	
Acenaphthylene	ND	98	
2,6-Dinitrotoluene	ND	98	
3-Nitroaniline	ND	490	
Acenaphthene	ND	98	
2,4-Dinitrophenol	ND	490	
4-Nitrophenol	ND	490	
Dibenzofuran	ND	98	
2,4-Dinitrotoluene	ND	98	
Diethylphthalate	ND	98	
4-Chlorophenyl phenyl ether	ND	98	
Fluorene	ND	98	
4-Nitroaniline	ND	490	
4,6-Dinitro-2-methylphenol	ND	490	
N-Nitrosodiphenylamine	ND	98	
4-Bromophenyl phenyl ether	ND	98	
Hexachlorobenzene	ND	98	
Pentachlorophenol	ND	490	
Phenanthrene	ND	98	
Anthracene	ND	98	
Di-n-butylphthalate	ND	98	

ND - Not Detected

PQL - Practical Quantitation Limit

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Lab Sample No. 31367-3

Client ID: CP-115A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	98	J
Pyrene	ND	98	
Butyl benzyl phthalate	ND	98	
3,3'-Dichlorobenzidine	ND	200	
Benzo(a)anthracene	ND	98	
Chrysene	ND	98	
bis(2-ethylhexyl)phthalate	19	98	
Di-n-octyl phthalate	ND	98	
Benzo(b)fluoranthene	ND	98	
Benzo(k)fluoranthene	ND	98	
Benzo(a)pyrene	ND	98	
Indeno(1,2,3-cd)pyrene	ND	98	
Dibenz(a,h)anthracene	ND	98	
Benzo(g,h,i)perylene	ND	98	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	X8	35 - 114	23 - 120
2-Fluorobiphenyl	X8	43 - 116	30 - 115
p-Terphenyl-d ₁₄	X8	33 - 141	18 - 137
Phenol-d ₆	X8	10 - 94	24 - 113
2-Fluorophenol	X8	21 - 100	25 - 121
2,4,6-Tribromophenol	X8	10 - 123	19 - 122

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Lab Sample No. 31367-3

Client ID: CP-115A-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	4.4	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-15-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	3.0	0.75	
TPH as	Diesel		

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	110
o-terphenyl	110

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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April 20, 1993

Lab Sample No. 31367-4

Client ID: CP-115B-0493

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	B1 J
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	54	5	
Acetone	1.5	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31367-4

Client ID: CP-115B-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	102	88 - 110	81 - 117
Bromofluorobenzene	92	86 - 115	74 - 121
1,2-Dichloroethane-D4	102	76 - 114	70 - 121

Continued

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Lab Sample No. 31367-4

Client ID: CP-115B-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-15-93

Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	10	
bis(2-Chloroethyl) ether	ND	10	
2-Chlorophenol	ND	10	
1,3-Dichlorobenzene	ND	10	
1,4-Dichlorobenzene	ND	10	
Benzyl Alcohol	ND	21	
1,2-Dichlorobenzene	ND	10	
2-Methylphenol	ND	10	
bis(2-Chloroisopropyl) ether	ND	10	
4-Methylphenol	ND	10	
N-Nitroso-Di-N-propylamine	ND	10	
Hexachloroethane	ND	10	
Nitrobenzene	ND	10	
Isophorone	ND	10	
2-Nitrophenol	ND	10	
2,4-Dimethylphenol	ND	10	
Benzoic Acid	ND	52	
bis(2-Chloroethoxy)methane	ND	10	
2,4-Dichlorophenol	ND	10	
1,2,4-Trichlorobenzene	ND	10	
Naphthalene	ND	10	
4-Chloroaniline	ND	21	
Hexachlorobutadiene	ND	10	
4-Chloro-3-methylphenol	ND	21	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab Sample No. 31367-4

Client ID: CP-115B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	10	
Hexachlorocyclopentadiene	ND	10	
2,4,6-Trichlorophenol	ND	10	
2,4,5-Trichlorophenol	ND	10	
2-Chloronaphthalene	ND	10	
2-Nitroaniline	ND	52	
Dimethyl phthalate	ND	10	
Acenaphthylene	ND	10	
2,6-Dinitrotoluene	ND	10	
3-Nitroaniline	ND	52	
Acenaphthene	ND	10	
2,4-Dinitrophenol	ND	52	
4-Nitrophenol	ND	52	
Dibenzofuran	ND	10	
2,4-Dinitrotoluene	ND	10	
Diethylphthalate	ND	10	
4-Chlorophenyl phenyl ether	ND	10	
Fluorene	ND	10	
4-Nitroaniline	ND	52	
4,6-Dinitro-2-methylphenol	ND	52	
N-Nitrosodiphenylamine	ND	10	
4-Bromophenyl phenyl ether	ND	10	
Hexachlorobenzene	ND	10	
Pentachlorophenol	ND	52	
Phenanthrene	ND	10	
Anthracene	ND	10	
Di-n-butylphthalate	5.0	10	J

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab Sample No. 31367-4

Client ID: CP-115B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	10	
Pyrene	ND	10	
Butyl benzyl phthalate	ND	10	
3,3'-Dichlorobenzidine	ND	21	
Benzo(a)anthracene	ND	10	
Chrysene	ND	10	
bis(2-ethylhexyl)phthalate	ND	10	
Di-n-octyl phthalate	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Indeno(1,2,3-cd)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	74	35 - 114	23 - 120
2-Fluorobiphenyl	59	43 - 116	30 - 115
p-Terphenyl-d ₁₄	67	33 - 141	18 - 137
Phenol-d ₆	22	10 - 94	24 - 113
2-Fluorophenol	49	21 - 100	25 - 121
2,4,6-Tribromophenol	92	10 - 123	19 - 122

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Lab Sample No. 31367-4

Client ID: CP-115B-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-94
Date Analyzed: 4-15-94

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-15-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

SURROGATE RECOVERY, %

1-chlorooctane	119
o-terphenyl	124

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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April 20, 1993

Lab Sample No. 31367-5

Client ID: CP-915A-0493

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	B1, J J
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	1.6	5	
Acetone	5.4	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab Sample No. 31367-5

Client ID: CP-915A-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	102	88 - 110	81 - 117
Bromofluorobenzene	96	86 - 115	74 - 121
1,2-Dichloroethane-D4	102	76 - 114	70 - 121

Continued



SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31367
April 20, 1993

Lab Sample No. 31367-5

Client ID: CP-915A-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-15-93

Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	41	
bis(2-Chloroethyl) ether	ND	41	
2-Chlorophenol	ND	41	
1,3-Dichlorobenzene	ND	41	
1,4-Dichlorobenzene	ND	41	
Benzyl Alcohol	ND	82	
1,2-Dichlorobenzene	ND	41	
2-Methylphenol	ND	41	
bis(2-Chloroisopropyl) ether	ND	41	
4-Methylphenol	ND	41	
N-Nitroso-Di-N-propylamine	ND	41	
Hexachloroethane	ND	41	
Nitrobenzene	ND	41	
Isophorone	ND	41	
2-Nitrophenol	ND	41	
2,4-Dimethylphenol	ND	41	
Benzoic Acid	ND	200	
bis(2-Chloroethoxy) methane	ND	41	
2,4-Dichlorophenol	ND	41	
1,2,4-Trichlorobenzene	ND	41	
Naphthalene	ND	41	
4-Chloroaniline	ND	82	
Hexachlorobutadiene	ND	41	
4-Chloro-3-methylphenol	ND	82	

ND - Not Detected

PQL - Practical Quantitation Limit

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SOUND ANALYTICAL SERVICES, INC.

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April 20, 1993

Lab Sample No. 31367-5

Client ID: CP-915A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	41	
Hexachlorocyclopentadiene	ND	41	
2,4,6-Trichlorophenol	ND	41	
2,4,5-Trichlorophenol	ND	41	
2-Chloronaphthalene	ND	41	
2-Nitroaniline	ND	200	
Dimethyl phthalate	ND	41	
Acenaphthylene	ND	41	
2,6-Dinitrotoluene	ND	41	
3-Nitroaniline	ND	200	
Acenaphthene	ND	41	
2,4-Dinitrophenol	ND	200	
4-Nitrophenol	ND	200	
Dibenzofuran	ND	41	
2,4-Dinitrotoluene	ND	41	
Diethylphthalate	ND	41	
4-Chlorophenyl phenyl ether	ND	41	
Fluorene	ND	41	
4-Nitroaniline	ND	200	
4,6-Dinitro-2-methylphenol	ND	200	
N-Nitrosodiphenylamine	ND	41	
4-Bromophenyl phenyl ether	ND	41	
Hexachlorobenzene	ND	41	
Pentachlorophenol	ND	200	
Phenanthrene	ND	41	
Anthracene	ND	41	
Di-n-butylphthalate	ND	41	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 29 of 38
 Lab No. 31367
 April 20, 1993

Lab Sample No. 31367-5

Client ID: CP-915A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	41	J
Pyrene	ND	41	
Butyl benzyl phthalate	ND	41	
3,3'-Dichlorobenzidine	ND	82	
Benzo(a)anthracene	ND	41	
Chrysene	ND	41	
bis(2-ethylhexyl)phthalate	8.5	41	
Di-n-octyl phthalate	ND	41	
Benzo(b)fluoranthene	ND	41	
Benzo(k)fluoranthene	ND	41	
Benzo(a)pyrene	ND	41	
Indeno(1,2,3-cd)pyrene	ND	41	
Dibenz(a,h)anthracene	ND	41	
Benzo(g,h,i)perylene	ND	41	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	69	35 - 114	23 - 120
2-Fluorobiphenyl	79	43 - 116	30 - 115
p-Terphenyl-d ₁₄	88	33 - 141	18 - 137
Phenol-d ₆	19	10 - 94	24 - 113
2-Fluorophenol	52	21 - 100	25 - 121
2,4,6-Tribromophenol	80	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
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Lab No. 31367
April 20, 1993

Lab Sample No. 31367-5

Client ID: CP-915A-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	7.1	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-15-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	3.6	0.75	
TPH as	Diesel		

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	125
o-terphenyl	114

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
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Lab No. 31367
April 20, 1993

Lab Sample No. 31367-6

Client ID: CP-122B-0493

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	ND	20	
Methylene Chloride	57	10	B1
Acetone	3.5	100	J
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	ND	10	
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	2.6	10	J
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
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Lab No. 31367
April 20, 1993

Lab Sample No. 31367-6

Client ID: CP-122B-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	10	
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	ND	10	
Chlorobenzene	ND	10	
Ethyl Benzene	ND	10	
Styrene	ND	10	
Total Xylenes	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	104	88 - 110	81 - 117
Bromofluorobenzene	98	86 - 115	74 - 121
1,2-Dichloroethane-D4	97	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
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Lab No. 31367
April 20, 1993

Lab Sample No. 31367-6

Client ID: CP-122B-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-15-93

Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	10	
bis(2-Chloroethyl) ether	ND	10	
2-Chlorophenol	ND	10	
1,3-Dichlorobenzene	ND	10	
1,4-Dichlorobenzene	ND	10	
Benzyl Alcohol	ND	21	
1,2-Dichlorobenzene	ND	10	
2-Methylphenol	ND	10	
bis(2-Chloroisopropyl) ether	ND	10	
4-Methylphenol	ND	10	
N-Nitroso-Di-N-propylamine	ND	10	
Hexachloroethane	ND	10	
Nitrobenzene	ND	10	
Isophorone	ND	10	
2-Nitrophenol	ND	10	
2,4-Dimethylphenol	ND	10	
Benzoic Acid	ND	52	
bis(2-Chloroethoxy)methane	ND	10	
2,4-Dichlorophenol	ND	10	
1,2,4-Trichlorobenzene	ND	10	
Naphthalene	ND	10	
4-Chloroaniline	ND	21	
Hexachlorobutadiene	ND	10	
4-Chloro-3-methylphenol	ND	21	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
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Lab No. 31367
April 20, 1993

Lab Sample No. 31367-6

Client ID: CP-122B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	10	
Hexachlorocyclopentadiene	ND	10	
2,4,6-Trichlorophenol	ND	10	
2,4,5-Trichlorophenol	ND	10	
2-Chloronaphthalene	ND	10	
2-Nitroaniline	ND	52	
Dimethyl phthalate	ND	10	
Acenaphthylene	ND	10	
2,6-Dinitrotoluene	ND	10	
3-Nitroaniline	ND	52	
Acenaphthene	ND	10	
2,4-Dinitrophenol	ND	52	
4-Nitrophenol	ND	52	
Dibenzofuran	ND	10	
2,4-Dinitrotoluene	ND	10	
Diethylphthalate	ND	10	
4-Chlorophenyl phenyl ether	ND	10	
Fluorene	ND	10	
4-Nitroaniline	ND	52	
4,6-Dinitro-2-methylphenol	ND	52	
N-Nitrosodiphenylamine	ND	10	
4-Bromophenyl phenyl ether	ND	10	
Hexachlorobenzene	ND	10	
Pentachlorophenol	ND	52	
Phenanthrene	ND	10	
Anthracene	ND	10	
Di-n-butylphthalate	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
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 Lab No. 31367
 April 20, 1993

Lab Sample No. 31367-6

Client ID: CP-122B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	10	
Pyrene	ND	10	
Butyl benzyl phthalate	ND	10	
3,3'-Dichlorobenzidine	ND	21	
Benzo(a)anthracene	ND	10	
Chrysene	ND	10	
bis(2-ethylhexyl)phthalate	ND	10	
Di-n-octyl phthalate	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Indeno(1,2,3-cd)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	68	35 - 114	23 - 120
2-Fluorobiphenyl	57	43 - 116	30 - 115
p-Terphenyl-d ₁₄	60	33 - 141	18 - 137
Phenol-d ₆	20	10 - 94	24 - 113
2-Fluorophenol	47	21 - 100	25 - 121
2,4,6-Tribromophenol	87	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
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Lab No. 31367
April 20, 1993

Lab Sample No. 31367-6

Client ID: CP-122B-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-15-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

SURROGATE RECOVERY, %
1-chlorooctane
o-terphenyl

114
130

ND - Not Detected
PQL - Practical Quantitation Limit

Continued



BURLINGTON ENVIRONMENTAL

RECEIVED

May 10, 1993

MAY 10 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Burlington Environmental Inc.
Technical Services

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46209

Dear Joe:

Two water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 13, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals and PCBs at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report. The PCBs were extracted and analyzed in batches. These dates are tabulated below. All PCB surrogates recovered between 50% and 150%.

Laboratory Number(s)	GC Run Number(s)	Date(s) Extracted	Date(s) Analyzed
46209-1,2, M04143-4, and B04143-4	AALA	4/14/93	4/15/93

The analyst(s) name(s) and the instrument used for each analyte are specified on the PCB report and are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure



BURLINGTON
ENVIRONMENTAL

General Laboratory Report

Lab Number : 46209

Plant/Generator Name : Pier 91; Project #624878 TASK 7306

Sample Type : Groundwater; CP-121, -110

Date of Receipt : 04/13/93 Analyst: BLW, BB, EL, DKW

Date of Report : 05/10/93 QC Checked: *Kattin Ojeda*

Parameters for Analysis: PCBs, Total and Dissolved Metals

Outside Lab : None Outside Lab Report No:

Data:

These two groundwater samples from the Pier 91 Project #624878 Task 7306, sample numbers CP-121-0493 and CP-110-0493 were analyzed for PCBs by Method 8080 and for Total and Dissolved Metals by Methods 7000 and 6010. Copies of all results are attached.

Comments and Conclusions:



CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6321

[illegible]

RELINQUISHED BY

RECEIVED BY

SIGNATURE		DATE	TIME	SIGNATURE		DATE	TIME
<i>Lores A. La Torre</i>		4-13-93	0810	<i>Katey Oehler</i>		4-13	8:10
SHIPPING NOTES				LAB NOTES			

PCB Laboratory Report

Page 1

Lab Number : 46209

Plant/Generator Name : / PIER 91 Pj# 624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/13/93

Analyst: BLW, BB, EL, DKW

Date of Report : 04/29/93

QC Checked: OK 5/3/93

Outside Lab : NONE

Outside Lab Report No:

Number of Samples :

<u>Run #</u>	<u>Sample ID</u>	<u>Code Numbers</u>	<u># Drums in Composite</u>	<u>Aroclor #</u>	<u>Total PCB (ppm)</u>
AALA46	B04143-4	BLANK			<0.1ppb
AALA45	M04143-4	METHOD SPIKE		1248	135%
AALA40	46209-1	CP-121-0493			<0.1ppb
AALA41	46209-2	CP-110-0493			<0.1ppb
AALA37	CCV	5 PPM CCV (111%)		1248	5.58
AALA48	CCV	5 PPM CCV (112%)		1254	5.61

Instrument: Hewlett Packard 5890 G.C.

Analysts: Al Flores-Serrano and Della Kay Wilson

Metals Laboratory Report

Lab Number : 46209

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/13/93

Analyst: BLW, BB, EL

Date of Report : 04/27/93

QC Checked: *[Signature]* 4/28/93

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab : NONE

Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	46209-1 TOTAL	46209-1 DISS.	46209-2 TOTAL	46209-2 DISS.
Metals:	CP-121-0493	CP-121-0493	CP-110-0493	CP-110-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

DATES ANALYZED: 4/14/93, 4/15/93, 4/20/93, 4/22/93

4/26/93, 4/27/93.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

RECEIVED

MAY 17 1993

Burlington Environmental Inc.
Technical Services

DATE: May 14, 1993

TO: David Broten, Burlington Environmental Engineering

PROJECT NAME: Pier 91

PROJECT NUMBER: 624878-7306

LABORATORY NUMBER: 31409

Enclosed are one original and one copy of the Tier II data deliverables package for Laboratory Work Order Number 31409. The samples were received for analysis at Sound Analytical Services, Inc., on April 13, 1993.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,



Andrew J. Riddell
Project Manager

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

May 13, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7306

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 31409

The samples were taken on 4/12/93 and were received at Sound on 4/13/93. The samples were analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons by EPA Method 418.1 modified for soil, and Total Petroleum Fuel Hydrocarbons by EPA Method 8015 modified. One oil sample was qualitatively screened for total petroleum fuel hydrocarbons in accordance with WA State DOE Method WTPH-HCID. The density of the oil sample was determined in accordance with Standard Methods for the Examination of Water and Wastewater (16th Ed.) Method 213 E.

VOLATILE ORGANICS

Samples 31409-1 through 31409-3 were analyzed on 4/16/93 and 4/19/93. Methylene chloride was detected in the method blanks at levels above the IDL. Results reported for methylene chloride in the associated samples were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS

Samples 31409-1 and 31409-2 were extracted on 4/15/93 and analyzed on 4/16/93. No compounds were detected in the method blank above the IDL. All QC parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS

Samples 31409-1 and 31409-2 were extracted on 4/15/93 and analyzed on 4/16/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS

Samples 31409-1 and 31409-2 were extracted on 4/14/93 and analyzed on 4/15/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

HYDROCARBON IDENTIFICATION

Sample 31409-4 was extracted on 4/16/93 and analyzed on 4/19/93. No contamination above the PQL was present in the method blank.

SPECIFIC GRAVITY

The specific gravity for sample 31409-4 was determined on 4/16/93.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental, Date: April 22, 1993
Technical Services

Report On: Analysis of Oil & Water Lab No.: 31409
Page 1 of 15

IDENTIFICATION:

Samples received on 04-13-93
Project: 624878-7306 Pier 91

ANALYSIS:

Lab Sample No. 31409-1

Client ID: CP-121-0493

Volatile Organics by Method 8240

Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	4.0	5	B1, J
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	0.77	5	J
1,2-Dichloroethane	1.2	5	J
2-Butanone	ND	25	
1,1,1-Trichloroethane	0.82	5	J
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	3.3	5	J
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
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Lab No. 31409
April 22, 1993

Lab Sample No. 31409-1

Client ID: CP-121-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	0.69	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	1.4	5	
Styrene	ND	5	
Total Xylenes	1.7	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	111	88 - 110	81 - 117
Bromofluorobenzene	87	86 - 115	74 - 121
1,2-Dichloroethane-D4	103	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 3 of 15
Lab No. 31409
April 22, 1993

Lab Sample No. 31409-1

Client ID: CP-121-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-15-93

Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.6	
bis(2-Chloroethyl) ether	ND	9.6	
2-Chlorophenol	ND	9.6	
1,3-Dichlorobenzene	ND	9.6	
1,4-Dichlorobenzene	ND	9.6	
Benzyl Alcohol	ND	19	
1,2-Dichlorobenzene	ND	9.6	
2-Methylphenol	ND	9.6	
bis(2-Chloroisopropyl) ether	ND	9.6	
4-Methylphenol	ND	9.6	
N-Nitroso-Di-N-propylamine	ND	9.6	
Hexachloroethane	ND	9.6	
Nitrobenzene	ND	9.6	
Isophorone	ND	9.6	
2-Nitrophenol	ND	9.6	
2,4-Dimethylphenol	ND	9.6	
Benzoic Acid	ND	48	
bis(2-Chloroethoxy) methane	ND	9.6	
2,4-Dichlorophenol	ND	9.6	
1,2,4-Trichlorobenzene	ND	9.6	
Naphthalene	ND	9.6	
4-Chloroaniline	ND	19	
Hexachlorobutadiene	ND	9.6	
4-Chloro-3-methylphenol	ND	19	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services

Project: 624878-7306 Pier 91

Page 4 of 15

Lab No. 31409

April 22, 1993

Lab Sample No. 31409-1

Client ID: CP-121-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	9.6	
Hexachlorocyclopentadiene	ND	9.6	
2,4,6-Trichlorophenol	ND	9.6	
2,4,5-Trichlorophenol	ND	9.6	
2-Chloronaphthalene	ND	9.6	
2-Nitroaniline	ND	48	
Dimethyl phthalate	ND	9.6	
Acenaphthylene	ND	9.6	
2,6-Dinitrotoluene	ND	9.6	
3-Nitroaniline	ND	48	
Acenaphthene	ND	9.6	
2,4-Dinitrophenol	ND	48	
4-Nitrophenol	ND	48	
Dibenzofuran	ND	9.6	
2,4-Dinitrotoluene	ND	9.6	
Diethylphthalate	ND	9.6	
4-Chlorophenyl phenyl ether	ND	9.6	
Fluorene	ND	9.6	
4-Nitroaniline	ND	48	
4,6-Dinitro-2-methylphenol	ND	48	
N-Nitrosodiphenylamine	ND	9.6	
4-Bromophenyl phenyl ether	ND	9.6	
Hexachlorobenzene	ND	9.6	
Pentachlorophenol	ND	48	
Phenanthrene	ND	9.6	
Anthracene	ND	9.6	
Di-n-butylphthalate	2.4	9.6	J

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 5 of 15
 Lab No. 31409
 April 22, 1993

Lab Sample No. 31409-1

Client ID: CP-121-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.6	J
Pyrene	ND	9.6	
Butyl benzyl phthalate	ND	9.6	
3,3'-Dichlorobenzidine	ND	19	
Benzo(a)anthracene	ND	9.6	
Chrysene	ND	9.6	
bis(2-ethylhexyl)phthalate	1.6	9.6	
Di-n-octyl phthalate	ND	9.6	
Benzo(b)fluoranthene	ND	9.6	
Benzo(k)fluoranthene	ND	9.6	
Benzo(a)pyrene	ND	9.6	
Indeno(1,2,3-cd)pyrene	ND	9.6	
Dibenz(a,h)anthracene	ND	9.6	
Benzo(g,h,i)perylene	ND	9.6	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	69	35 - 114	23 - 120
2-Fluorobiphenyl	64	43 - 116	30 - 115
p-Terphenyl-d ₁₄	67	33 - 141	18 - 137
Phenol-d ₆	23	10 - 94	24 - 113
2-Fluorophenol	44	21 - 100	25 - 121
2,4,6-Tribromophenol	80	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 6 of 15
Lab No. 31409
April 22, 1993

Lab Sample No. 31409-1

Client ID: CP-121-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-16-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons, mg/L	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	109
o-terphenyl	115

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 7 of 15
Lab No. 31409
April 22, 1993

Lab Sample No. 31409-2

Client ID: CP-110-0493

Volatile Organics by Method 8240
Date Analyzed: 4-19-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	24	10	
Methylene Chloride	ND	5	
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 8 of 15
Lab No. 31409
April 22, 1993

Lab Sample No. 31409-2

Client ID: CP-110-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	5.8	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	1.3	5	J
Chlorobenzene	ND	5	
Ethyl Benzene	1.7	5	J
Styrene	ND	5	
Total Xylenes	3.1	5	J

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	104	88 - 110	81 - 117
Bromofluorobenzene	86	86 - 115	74 - 121
1,2-Dichloroethane-D4	103	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 9 of 15
Lab No. 31409
April 22, 1993

Lab Sample No. 31409-2

Client ID: CP-110-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-15-93

Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.6	
bis(2-Chloroethyl) ether	ND	9.6	
2-Chlorophenol	ND	9.6	
1,3-Dichlorobenzene	ND	9.6	
1,4-Dichlorobenzene	ND	9.6	
Benzyl Alcohol	ND	19	
1,2-Dichlorobenzene	ND	9.6	
2-Methylphenol	ND	9.6	
bis(2-Chloroisopropyl) ether	ND	9.6	
4-Methylphenol	ND	9.6	
N-Nitroso-Di-N-propylamine	ND	9.6	
Hexachloroethane	ND	9.6	
Nitrobenzene	ND	9.6	
Isophorone	ND	9.6	
2-Nitrophenol	ND	9.6	
2,4-Dimethylphenol	ND	9.6	
Benzoic Acid	ND	48	
bis(2-Chloroethoxy) methane	ND	9.6	
2,4-Dichlorophenol	ND	9.6	
1,2,4-Trichlorobenzene	ND	9.6	
Naphthalene	ND	9.6	
4-Chloroaniline	ND	19	
Hexachlorobutadiene	ND	9.6	
4-Chloro-3-methylphenol	ND	19	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 10 of 15
Lab No. 31409
April 22, 1993

Lab Sample No. 31409-2

Client ID: CP-110-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	2.7	9.6	J
Hexachlorocyclopentadiene	ND	9.6	
2,4,6-Trichlorophenol	ND	9.6	
2,4,5-Trichlorophenol	ND	9.6	
2-Chloronaphthalene	ND	9.6	
2-Nitroaniline	ND	48	
Dimethyl phthalate	ND	9.6	
Acenaphthylene	ND	9.6	
2,6-Dinitrotoluene	ND	9.6	
3-Nitroaniline	ND	48	
Acenaphthene	2.6	9.6	J
2,4-Dinitrophenol	ND	48	
4-Nitrophenol	ND	48	
Dibenzofuran	ND	9.6	
2,4-Dinitrotoluene	ND	9.6	
Diethylphthalate	ND	9.6	
4-Chlorophenyl phenyl ether	ND	9.6	
Fluorene	6.8	9.6	J
4-Nitroaniline	ND	48	
4,6-Dinitro-2-methylphenol	ND	48	
N-Nitrosodiphenylamine	ND	9.6	
4-Bromophenyl phenyl ether	ND	9.6	
Hexachlorobenzene	ND	9.6	
Pentachlorophenol	ND	48	
Phenanthrene	4.1	9.6	J
Anthracene	ND	9.6	
Di-n-butylphthalate	1.4	9.6	J

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 11 of 15
 Lab No. 31409
 April 22, 1993

Lab Sample No. 31409-2

Client ID: CP-110-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.6	
Pyrene	ND	9.6	
Butyl benzyl phthalate	ND	9.6	
3,3'-Dichlorobenzidine	ND	19	
Benzo(a)anthracene	ND	9.6	
Chrysene	ND	9.6	
bis(2-ethylhexyl)phthalate	ND	9.6	
Di-n-octyl phthalate	ND	9.6	
Benzo(b)fluoranthene	ND	9.6	
Benzo(k)fluoranthene	ND	9.6	
Benzo(a)pyrene	ND	9.6	
Indeno(1,2,3-cd)pyrene	ND	9.6	
Dibenz(a,h)anthracene	ND	9.6	
Benzo(g,h,i)perylene	ND	9.6	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	65	35 - 114	23 - 120
2-Fluorobiphenyl	63	43 - 116	30 - 115
p-Terphenyl-d ₁₄	69	33 - 141	18 - 137
Phenol-d ₆	25	10 - 94	24 - 113
2-Fluorophenol	47	21 - 100	25 - 121
2,4,6-Tribromophenol	90	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 12 of 15
Lab No. 31409
April 22, 1993

Lab Sample No. 31409-2

Client ID: CP-110-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-16-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons, mg/L	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	109
o-terphenyl	112

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 13 of 15
Lab No. 31409
April 22, 1993

Lab Sample No. 31409-3

Client ID: Trip Blank #6

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	B1
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	ND	20	
Methylene Chloride	58	10	
Acetone	ND	100	
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	ND	10	
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	ND	10	
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 14 of 15
Lab No. 31409
April 22, 1993

Lab Sample No. 31409-3

Client ID: Trip Blank #6

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	10	
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	ND	10	
Chlorobenzene	ND	10	
Ethyl Benzene	ND	10	
Styrene	ND	10	
Total Xylenes	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	104	88 - 110	81 - 117
Bromofluorobenzene	95	86 - 115	74 - 121
1,2-Dichloroethane-D4	103	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 15 of 15
Lab No. 31409
April 22, 1993

Lab Sample No. 31409-4
Matrix: Oil

Client ID: CP-110-0493

WTPH-HCID
Date Extracted: 4-16-93
Date Analyzed: 4-20-93

<u>Parameters</u>	<u>Concentration, mg/kg</u>	<u>Flag</u>
Gasoline (C7 - C12)	> 20	
Diesel (> C12 - C24)	> 50	
Heavy Oil (C24+)	< 100	

SURROGATE RECOVERY, %

1-chlorooctane	X10
o-terphenyl	X10

ND - Not Detected
PQL - Practical Quantitation Limit

<u>Parameter</u>	<u>Result</u>
Specific Gravity	0.9506

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

DATA QUALIFIER FLAGS

- ND: Indicates that the analyte was analyzed for but was not detected. The associated numerical value is the practical quantitation limit, corrected for sample dilution.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- C: The identification of this analyte was confirmed by GC/MS.
- B1: This analyte was also detected in the associated method blank. The reported sample results have been adjusted for moisture, final extract volume, and/or dilutions performed during extract preparation. The analyte concentration was evaluated prior to sample preparation adjustments, and was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was also detected in the associated method blank. However, the analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- E: The concentration of this analyte exceeded the instrument calibration range.
- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- A: This TIC is a suspected aldol-condensation product.
- M: Quantitation Limits are elevated due to matrix interferences.
- S: The calibration quality control criteria for this compound were not met. The reported concentration should be considered an estimated quantity.
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.
- X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.
- X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.
- X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results. Sample matrix is nonhomogeneous.
- X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike was diluted out during analysis.
- X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: RPD value for MS/MSD outside QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside QC limits due to matrix composition.
- X10: Surrogate recovery outside QC limits due to high contaminant levels.



BURLINGTON ENVIRONMENTAL

RECEIVED

May 10, 1993

MAY 10 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Burlington Environmental Inc.
Technical Services

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46245

Dear Joe:

Three water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 14, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals and PCBs at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report. The PCBs were extracted and analyzed in batches. These dates are tabulated below. All PCB surrogates recovered between 50% and 150%.

Laboratory Number(s)	GC Run Number(s)	Date(s) Extracted	Date(s) Analyzed
46245-1,2,3, M04143-4, and B04143-4	AALA	4/14/93	4/15/93

The analyst(s) name(s) and the instrument used for each analyte are specified on the PCB report and are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure



BURLINGTON
ENVIRONMENTAL

General Laboratory Report

Lab Number : 46245

Plant/Generator Name : Pier 91; Project #624878 TASK 7306

Sample Type : Groundwater; CP-117, CP-118, and CP-119-0493

Date of Receipt : 04/14/93 Analyst: BLW,BB,EL,DKW

Date of Report : 05/10/93 QC Checked: *Kathy Dep...*

Parameters for Analysis: PCBs, Total and Dissolved Metals

Outside Lab : None Outside Lab Report No:

Data:

These three groundwater samples from the Pier 91 Project #624878, Task 7306, sample numbers CP-117-0493, CP-118-0493, CP-119-0493 were analyzed for PCBs by Method 8080 and for Total and Dissolved Metals by Methods 7000 and 6010. Copies of all results are attached.

Comments and Conclusions:

Lab Number : 46245
Plant/Generator Name : / PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/14/93 Analyst: BLW, BB, EL, DKW
Date of Report : 04/29/93 QC Checked: WJH 5/3/93
Outside Lab : NONE Outside Lab Report No:
Number of Samples :

<u>Run #</u>	<u>Sample ID</u>	<u>Code Numbers</u>	<u># Drums in Composite</u>	<u>Aroclor #</u>	<u>Total PCB (ppm)</u>
AALA46	B04143-4	BLANK			<0.1ppb
AALA45	M04143-4	METHOD SPIKE		1248	135%
AALA42	46245-1	CP-117-0493			<1.0ppb
AALA43	46245-2	CP-118-0493			<1.0ppb
AALA44	46245-3	CP-119-0493		1254	0.41ppb
AALA37	CCV	5 PPM CCV (111%)		1248	5.58
)			
AALA48	CCV	5 PPM CCV (112%)		1254	5.61
)			

Instrument: Hewlett Packard 5890 G.C.
Analysts: Al Flores-Serrano and Della Kay Wilson

Metals Laboratory Report

Lab Number : 46245

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/14/93

Analyst: BLW BB EL

Date of Report : 04/27/93

QC Checked: *[Signature]* 4/27/93

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab

: NONE

Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	46245-1 TOTAL	46245-1 DISS.	46245-2 TOTAL	
Metals:	CP-117-0493	CP-117-0493	CP-118-0493	CP-118-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

DATES ANALYZED: 4/15/93, 4/22/93, 4/23/93, 4/26/93

Metals Laboratory Report

Lab Number : 46245

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/14/93

Analyst: BLW, BB, EL

Date of Report : 04/27/93

QC Checked: *[Signature]* 4/27/93

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab : NONE

Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46245-3 TOTAL CP-119-0493	46245-3 DISS. CP-119-0493	46245-1 MS % RECOVERY	46245-1 MSD % RECOVERY
Silver	<0.010	<0.010	95.6	95.4
Arsenic	<0.010	<0.010	85.3	94.4
Barium	<0.20	<0.20	91.0	92.3
Beryllium	<0.005	<0.005	95.8	96.8
Cadmium	<0.005	<0.005	97.0	94.2
Chromium	0.016	<0.010	98.8	98.5
Copper	<0.025	<0.025	94.9	95.4
Mercury	<0.0002	<0.0002	111.8	97.3
Nickel	<0.040	<0.040	95.7	97.2
Lead	0.009	<0.003	88.0	96.0
Selenium	<0.005	<0.005	114.8	107.3
Zinc	0.030	<0.020	93.2	95.6

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L AND PERCENT RECOVERY.



BURLINGTON ENVIRONMENTAL

RECEIVED

MAY 10 1993

May 10, 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Burlington Environmental Inc.
Technical Services

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46278

Dear Joe:

Six water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 15, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals and PCBs at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report. The PCBs were extracted and analyzed in batches. These dates are tabulated below. All PCB surrogates recovered between 50% and 150%, except for 46278-6MS which had a TCMX surrogate recovery of 185%.

Laboratory Number(s)	GC Run Number(s)	Date(s) Extracted	Date(s) Analyzed
46278-1,2,3,3MS,3MSD, 4,5,6,6MS,6MSD, and B04153-1	AALB, DAFV and DAFX	4/15/93 and 4/23/93	4/19/93, 4/23/93 and 4/27/93

The analyst(s) name(s) and the instrument used for each analyte are specified on the PCB report and are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure



BURLINGTON
ENVIRONMENTAL

General Laboratory Report

Lab Number : 46278

Plant/Generator Name : Pier 91; Project #624878 Task 7306

Sample Type : Groundwater; CP-W10, -109M, -109, -116M, -116, -39

Date of Receipt : 04/15/93 Analyst: BLW, BB, EL, DKW

Date of Report : 05/07/93 QC Checked: *Kathy Deep*

Parameters for Analysis: Total and Dissolved Metals, PCBs

Outside Lab : None Outside Lab Report No:

Data:

These water samples from the Pier 91 Project #624878, Task 7306, sample numbers CP-W10-0493, CP-109M-0493, CP-109-0493, CP-116M-0493, CP-116-0493, CP-39-3-0493 were analyzed for Total and Dissolved Metals by Method 7000 and 6010 and PCBs by Method 8080. Copies of the results are attached.

Comments and Conclusions:



CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. E286

[illegible]

RELINQUISHED BY

RECEIVED BY

SIGNATURE		DATE	TIME	SIGNATURE		DATE	TIME
				[Signature]		4/15/19	080
SHIPPING NOTES				LAB NOTES			

PCB Laboratory Report

Page 1

Lab Number : 46278

Plant/Generator Name : / PIER 91 Pj# 624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/15/93 Analyst: BLW, BB, EL, DKW

Date of Report : 04/29/93 QC Checked: PD 5/2/93

Outside Lab : NONE Outside Lab Report No:

Number of Samples :

Run #	Sample ID	Code Numbers	# Drums in Composite	Aroclor #	Total PCB (ppm)
AALB29	B04153-1	BLANK			<0.1ppb
AALB20	46278-1	CP-W10-0493			<0.1ppb
AALB21	46278-2	CP-109M-0493			<0.1ppb
AALB22	46278-3	CP-109-0493			<0.1ppb
DAFV108	46278-3M	MATRIX SPIKE	1248		120%
DAFV109	46278-3M	MATRIX SPIKE DUPLICATE (RSD=4%)	1248		125%
AALB23	46278-4	CP-116M-0493			<0.1ppb
DAFX73	46278-5	CP-116-0493			<50ppb
AALB25	46278-6	CP-39-3-0493			<0.1ppb
AALB27	46278-6M	METHOD SPIKE SAMPLE CONCENTRATED DUE TO EVAPORATION OF SOLVENT IN VIAL WITH LOOSE CAP.	1248		305%
AALB28	46278-6M	METHOD SPIKE DUPE (RSD=81%)	1248		130%
AALB15	CCV	5 PPM CCV (113%)	1248		5.63
AALB26	CCV	5 PPM CCV (113%)	1254		5.66
AALB37	CCV	5 PPM CCV (113%)	1248		5.64
DAFV100	CCV	5 PPM CCV (99%)	1248		4.97
DAFV110	CCV	5 PPM CCV (110%)	1248		5.49
DAFX65	CCV	5 PPM CCV (91%)	1248		4.55
DAFX76	CCV	5 PPM CCV (111%)	1248		5.56

Instruments: Hewlett Packard 5890 and 5890 Series II G.C.s
Analysts: Al Flores-Serrano and Della Kay Wilson

Metals Laboratory Report

Lab Number : 46278
Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/15/93 Analyst: BLW, BB, EL
Date of Report : 04/29/93 QC Checked: *[Signature]* 4/20/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No: '

METALS BY SW-846 3010, 6010, 7000.

	46278-1 TOTAL	46278-1 DISS.	46278-2 TOTAL	46278-2 DISS.
Metals:	CP-W10-0493	CP-W10-0493	CP-109M-0493	CP-109M-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

DATES ANALYZED: 4/16/93, 4/26/93, 4/27/93, 4/28/93

Metals Laboratory Report

Lab Number : 46278
Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/15/93 Analyst: BLW, BB, EL
Date of Report : 04/29/93 QC Checked: *[Signature]*
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No: '

METALS BY SW-846 3010, 6010, 7000.

	46278-3 TOTAL	46278-3 DISS.	46278-4 TOTAL	46278-4 DISS.
Metals:	CP-109-0493	CP-109-0493	CP-116M-0493	CP-116M-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

Metals Laboratory Report

Lab Number : 46278

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/15/93

Analyst: BLW BB EI

Date of Report : 04/29/93

QC Checked: *[Signature]* 4/29/93

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab : NONE

Outside Lab Report No: '

METALS BY SW-846 3010, 6010, 7000.

	46278-5 TOTAL	46278-5 DISS.	46278-6 TOTAL	46278-6 DISS.
Metals:	CP-116-0493	CP-116-0493	CP-39-3-0493	CP-39-3-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	0.004	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

RECEIVED

MAY 19 1993

Burlington Environmental Inc.
Technical Services

DATE: May 17, 1993

TO: David Broten, Burlington Environmental Engineering

PROJECT NAME: Pier 91

PROJECT NUMBER: 624878-7306

LABORATORY NUMBER: 31448

Enclosed are one original and one copy of the Tier II data deliverables package for Laboratory Work Order Number 31448. The samples were received for analysis at Sound Analytical Services, Inc., on April 15, 1993.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,



Andrew J. Riddell
Project Manager

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

May 14, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7306

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 31448

The samples were taken on 4/14/93 and were received at Sound on 4/15/93. The samples were analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons by EPA Method 418.1 modified for soil, and Total Petroleum Fuel Hydrocarbons by EPA Method 8015 modified. Two oil samples were qualitatively screened for total petroleum fuel hydrocarbons in accordance with WA State DOE Method WTPH-HCID. The densities of the oil samples were determined in accordance with Standard Methods for the Examination of Water and Wastewater (16th Ed.) Method 213 E.

VOLATILE ORGANICS

Samples 31448-1 through 31448-6 were analyzed on 4/20/93. Methylene chloride and acetone were detected in the method blanks at levels above the IDL. Results reported for these compounds in the associated samples were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS

Samples 31448-1 through 31448-6 were extracted on 4/20/93 and analyzed on 4/21/93. Di-n-butylphthalate was detected in the method blank above the IDL. Results reported for this compound in the associated samples were flagged B to indicate this. All QC parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS

Samples 31448-1 through 31448-6 were extracted on 4/21/93 and analyzed on 4/22/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS

Samples 31448-1 through 31448-6 were extracted on 4/19/93 and analyzed on 4/20/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

SOUND ANALYTICAL SERVICES, INC.

PROJECT NUMBER: 624878-7306

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 31448

HYDROCARBON IDENTIFICATION

Samples 31448-7 and 31448-8 were extracted on 4/19/93 and analyzed on 4/20/93. No contamination above the PQL was present in the method blank.

SPECIFIC GRAVITY

The specific gravity for samples 31448-7 and 31448-8 was determined on 4/19/93.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental, Date: April 28, 1993
Technical Services

Report On: Analysis of Oil & Water Lab No.: 31448
Page 1 of 38

IDENTIFICATION:

Samples received on 04-14-93
Project: 624878-7306 Pier 91

ANALYSIS:

Lab Sample No. 31448-1
Matrix: Water

Client ID: CP-W10-0493

Volatile Organics by Method 8240
Date Analyzed: 4-20-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	B1, J
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	ND	5	
Acetone	12	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 2 of 38
 Lab No. 31448
 April 28, 1993

Lab Sample No. 31448-1
 Matrix: Water

Client ID: CP-W10-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	14	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	3.2	5	J
Chlorobenzene	ND	5	
Ethyl Benzene	9.5	5	J
Styrene	ND	5	
Total Xylenes	3.7	5	J

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	103	88 - 110	81 - 117
Bromofluorobenzene	91	86 - 115	74 - 121
1,2-Dichloroethane-D4	102	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 3 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-1
Matrix: Water

Client ID: CP-W10-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-20-93
Date Analyzed: 4-21-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.2	
bis(2-Chloroethyl) ether	ND	9.2	
2-Chlorophenol	ND	9.2	
1,3-Dichlorobenzene	ND	9.2	
1,4-Dichlorobenzene	ND	9.2	
Benzyl Alcohol	ND	18	
1,2-Dichlorobenzene	ND	9.2	
2-Methylphenol	ND	9.2	
bis(2-Chloroisopropyl)ether	ND	9.2	
4-Methylphenol	ND	9.2	
N-Nitroso-Di-N-propylamine	ND	9.2	
Hexachloroethane	ND	9.2	
Nitrobenzene	ND	9.2	
Isophorone	ND	9.2	
2-Nitrophenol	ND	9.2	
2,4-Dimethylphenol	ND	9.2	
Benzoic Acid	ND	46	
bis(2-Chloroethoxy)methane	ND	9.2	
2,4-Dichlorophenol	ND	9.2	
1,2,4-Trichlorobenzene	ND	9.2	
Naphthalene	19	9.2	
4-Chloroaniline	ND	18	
Hexachlorobutadiene	ND	9.2	
4-Chloro-3-methylphenol	ND	18	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 4 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-1
Matrix: Water

Client ID: CP-W10-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	24	9.2	
Hexachlorocyclopentadiene	ND	9.2	
2,4,6-Trichlorophenol	ND	9.2	
2,4,5-Trichlorophenol	ND	9.2	
2-Chloronaphthalene	ND	9.2	
2-Nitroaniline	ND	46	
Dimethyl phthalate	ND	9.2	
Acenaphthylene	ND	9.2	
2,6-Dinitrotoluene	ND	9.2	
3-Nitroaniline	ND	46	
Acenaphthene	3.5	9.2	J
2,4-Dinitrophenol	ND	46	
4-Nitrophenol	ND	46	
Dibenzofuran	3.9	9.2	J
2,4-Dinitrotoluene	ND	9.2	
Diethylphthalate	ND	9.2	
4-Chlorophenyl phenyl ether	ND	9.2	
Fluorene	6.1	9.2	J
4-Nitroaniline	ND	46	
4,6-Dinitro-2-methylphenol	ND	46	
N-Nitrosodiphenylamine	ND	9.2	
4-Bromophenyl phenyl ether	ND	9.2	
Hexachlorobenzene	ND	9.2	
Pentachlorophenol	ND	46	
Phenanthrene	4.3	9.2	J
Anthracene	ND	9.2	
Di-n-butylphthalate	20	9.2	B1

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 5 of 38
 Lab No. 31448
 April 28, 1993

Lab Sample No. 31448-1
 Matrix: Water

Client ID: CP-W10-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.2	J
Pyrene	ND	9.2	
Butyl benzyl phthalate	ND	9.2	
3,3'-Dichlorobenzidine	ND	18	
Benzo(a)anthracene	ND	9.2	
Chrysene	ND	9.2	
bis(2-ethylhexyl)phthalate	ND	9.2	
Di-n-octyl phthalate	ND	9.2	
Benzo(b)fluoranthene	ND	9.2	
Benzo(k)fluoranthene	2.3	9.2	
Benzo(a)pyrene	ND	9.2	
Indeno(1,2,3-cd)pyrene	ND	9.2	
Dibenz(a,h)anthracene	ND	9.2	
Benzo(g,h,i)perylene	ND	9.2	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	69	35 - 114	23 - 120
2-Fluorobiphenyl	71	43 - 116	30 - 115
p-Terphenyl-d ₁₄	83	33 - 141	18 - 137
Phenol-d ₆	22	10 - 94	24 - 113
2-Fluorophenol	45	21 - 100	25 - 121
2,4,6-Tribromophenol	79	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 6 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-1
Matrix: Water

Client ID: CP-W10-0493

TPH Per EPA Method 418.1
Date Extracted: 4-19-93
Date Analyzed: 4-20-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	27	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-21-93
Date Analyzed: 4-22-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	X2

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	104
o-terphenyl	121

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 7 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-2
Matrix: Water

Client ID: CP-109M-0493

Volatile Organics by Method 8240
Date Analyzed: 4-20-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	B1, J B2
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	0.65	5	
Acetone	59	50	J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	0.64	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 8 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-2
Matrix: Water

Client ID: CP-109M-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	105	88 - 110	81 - 117
Bromofluorobenzene	90	86 - 115	74 - 121
1,2-Dichloroethane-D4	97	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 9 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-2
Matrix: Water

Client ID: CP-109M-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-20-93
Date Analyzed: 4-21-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.4	
bis(2-Chloroethyl) ether	ND	9.4	
2-Chlorophenol	ND	9.4	
1,3-Dichlorobenzene	ND	9.4	
1,4-Dichlorobenzene	ND	9.4	
Benzyl Alcohol	ND	19	
1,2-Dichlorobenzene	ND	9.4	
2-Methylphenol	ND	9.4	
bis(2-Chloroisopropyl)ether	ND	9.4	
4-Methylphenol	ND	9.4	
N-Nitroso-Di-N-propylamine	ND	9.4	
Hexachloroethane	ND	9.4	
Nitrobenzene	ND	9.4	
Isophorone	ND	9.4	
2-Nitrophenol	ND	9.4	
2,4-Dimethylphenol	ND	9.4	
Benzoic Acid	ND	47	
bis(2-Chloroethoxy)methane	ND	9.4	
2,4-Dichlorophenol	ND	9.4	
1,2,4-Trichlorobenzene	ND	9.4	
Naphthalene	ND	9.4	
4-Chloroaniline	ND	19	
Hexachlorobutadiene	ND	9.4	
4-Chloro-3-methylphenol	ND	19	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 10 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-2
Matrix: Water

Client ID: CP-109M-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	9.4	
Hexachlorocyclopentadiene	ND	9.4	
2,4,6-Trichlorophenol	ND	9.4	
2,4,5-Trichlorophenol	ND	9.4	
2-Chloronaphthalene	ND	9.4	
2-Nitroaniline	ND	47	
Dimethyl phthalate	ND	9.4	
Acenaphthylene	ND	9.4	
2,6-Dinitrotoluene	ND	9.4	
3-Nitroaniline	ND	47	
Acenaphthene	ND	9.4	
2,4-Dinitrophenol	ND	47	
4-Nitrophenol	ND	47	
Dibenzofuran	ND	9.4	
2,4-Dinitrotoluene	ND	9.4	
Diethylphthalate	ND	9.4	
4-Chlorophenyl phenyl ether	ND	9.4	
Fluorene	ND	9.4	
4-Nitroaniline	ND	47	
4,6-Dinitro-2-methylphenol	ND	47	
N-Nitrosodiphenylamine	ND	9.4	
4-Bromophenyl phenyl ether	ND	9.4	
Hexachlorobenzene	ND	9.4	
Pentachlorophenol	ND	47	
Phenanthrene	ND	9.4	
Anthracene	ND	9.4	
Di-n-butylphthalate	5.2	9.4	B1, J

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 11 of 38
 Lab No. 31448
 April 28, 1993

Lab Sample No. 31448-2
 Matrix: Water

Client ID: CP-109M-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.4	
Pyrene	ND	9.4	
Butyl benzyl phthalate	ND	9.4	
3,3'-Dichlorobenzidine	ND	19	
Benzo(a)anthracene	ND	9.4	
Chrysene	ND	9.4	
bis(2-ethylhexyl)phthalate	ND	9.4	
Di-n-octyl phthalate	ND	9.4	
Benzo(b)fluoranthene	ND	9.4	
Benzo(k)fluoranthene	ND	9.4	
Benzo(a)pyrene	ND	9.4	
Indeno(1,2,3-cd)pyrene	ND	9.4	
Dibenz(a,h)anthracene	ND	9.4	
Benzo(g,h,i)perylene	ND	9.4	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	78	35 - 114	23 - 120
2-Fluorobiphenyl	64	43 - 116	30 - 115
p-Terphenyl-d ₁₄	85	33 - 141	18 - 137
Phenol-d ₆	20	10 - 94	24 - 113
2-Fluorophenol	44	21 - 100	25 - 121
2,4,6-Tribromophenol	68	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31448
April 28, 1993

Lab Sample No. 31448-2
Matrix: Water

Client ID: CP-109M-0493

TPH Per EPA Method 418.1
Date Extracted: 4-19-93
Date Analyzed: 4-20-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	44	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-21-93
Date Analyzed: 4-22-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	96
o-terphenyl	126

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31448
April 28, 1993

Lab Sample No. 31448-3
Matrix: Water

Client ID: CP-109-0493

Volatile Organics by Method 8240
Date Analyzed: 4-20-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	B1, J
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	76	10	
Methylene Chloride	ND	5	
Acetone	9.2	50	J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	2.8	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab Sample No. 31448-3
 Matrix: Water

Client ID: CP-109-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	29	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	6.6	5	
Chlorobenzene	ND	5	
Ethyl Benzene	3.4	5	J
Styrene	ND	5	
Total Xylenes	4.8	5	J

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	102	88 - 110	81 - 117
Bromofluorobenzene	91	86 - 115	74 - 121
1,2-Dichloroethane-D4	95	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31448
April 28, 1993

Lab Sample No. 31448-3
Matrix: Water

Client ID: CP-109-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-20-93
Date Analyzed: 4-21-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.1	
bis(2-Chloroethyl) ether	ND	9.1	
2-Chlorophenol	ND	9.1	
1,3-Dichlorobenzene	ND	9.1	
1,4-Dichlorobenzene	ND	9.1	
Benzyl Alcohol	ND	18	
1,2-Dichlorobenzene	ND	9.1	
2-Methylphenol	ND	9.1	
bis(2-Chloroisopropyl) ether	ND	9.1	
4-Methylphenol	ND	9.1	
N-Nitroso-Di-N-propylamine	ND	9.1	
Hexachloroethane	ND	9.1	
Nitrobenzene	ND	9.1	
Isophorone	ND	9.1	
2-Nitrophenol	ND	9.1	
2,4-Dimethylphenol	ND	9.1	
Benzoic Acid	ND	45	
bis(2-Chloroethoxy)methane	ND	9.1	
2,4-Dichlorophenol	ND	9.1	
1,2,4-Trichlorobenzene	ND	9.1	
Naphthalene	14	9.1	
4-Chloroaniline	ND	18	
Hexachlorobutadiene	ND	9.1	
4-Chloro-3-methylphenol	ND	18	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
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Lab No. 31448
April 28, 1993

Lab Sample No. 31448-3
Matrix: Water

Client ID: CP-109-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	62	9.1	
Hexachlorocyclopentadiene	ND	9.1	
2,4,6-Trichlorophenol	ND	9.1	
2,4,5-Trichlorophenol	ND	9.1	
2-Chloronaphthalene	ND	9.1	
2-Nitroaniline	ND	45	
Dimethyl phthalate	ND	9.1	
Acenaphthylene	ND	9.1	
2,6-Dinitrotoluene	ND	9.1	
3-Nitroaniline	ND	45	
Acenaphthene	ND	9.1	
2,4-Dinitrophenol	ND	45	
4-Nitrophenol	ND	45	
Dibenzofuran	1.7	9.1	J
2,4-Dinitrotoluene	ND	9.1	
Diethylphthalate	ND	9.1	
4-Chlorophenyl phenyl ether	ND	9.1	
Fluorene	3.8	9.1	J
4-Nitroaniline	ND	45	
4,6-Dinitro-2-methylphenol	ND	45	
N-Nitrosodiphenylamine	ND	9.1	
4-Bromophenyl phenyl ether	ND	9.1	
Hexachlorobenzene	ND	9.1	
Pentachlorophenol	ND	45	
Phenanthrene	2.5	9.1	J
Anthracene	ND	9.1	
Di-n-butylphthalate	11	9.1	B1

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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 Lab No. 31448
 April 28, 1993

Lab Sample No. 31448-3
 Matrix: Water

Client ID: CP-109-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.1	
Pyrene	ND	9.1	
Butyl benzyl phthalate	ND	9.1	
3,3'-Dichlorobenzidine	ND	18	
Benzo(a)anthracene	ND	9.1	
Chrysene	ND	9.1	
bis(2-ethylhexyl)phthalate	ND	9.1	
Di-n-octyl phthalate	ND	9.1	
Benzo(b)fluoranthene	ND	9.1	
Benzo(k)fluoranthene	ND	9.1	
Benzo(a)pyrene	ND	9.1	
Indeno(1,2,3-cd)pyrene	ND	9.1	
Dibenz(a,h)anthracene	ND	9.1	
Benzo(g,h,i)perylene	ND	9.1	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	67	35 - 114	23 - 120
2-Fluorobiphenyl	75	43 - 116	30 - 115
p-Terphenyl-d ₁₄	74	33 - 141	18 - 137
Phenol-d ₆	20	10 - 94	24 - 113
2-Fluorophenol	41	21 - 100	25 - 121
2,4,6-Tribromophenol	83	10 - 123	19 - 122

Continued

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April 28, 1993

Lab Sample No. 31448-3
Matrix: Water

Client ID: CP-109-0493

TPH Per EPA Method 418.1
Date Extracted: 4-19-93
Date Analyzed: 4-20-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	130	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-21-93
Date Analyzed: 4-22-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	4.1	0.75	X2

TPH as Gasoline, Diesel

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	105
o-terphenyl	117

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31448
April 28, 1993

Lab Sample No. 31448-4
Matrix: Water

Client ID: CP-116M-0493

Volatile Organics by Method 8240
Date Analyzed: 4-20-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	0.67	5	B1, J
Acetone	58	50	B2
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	0.70	5	J
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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 April 28, 1993

Lab Sample No. 31448-4
 Matrix: Water

Client ID: CP-116M-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	109	88 - 110	81 - 117
Bromofluorobenzene	88	86 - 115	74 - 121
1,2-Dichloroethane-D4	95	76 - 114	70 - 121

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31448
April 28, 1993

Lab Sample No. 31448-4
Matrix: Water

Client ID: CP-116M-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-20-93
Date Analyzed: 4-21-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.4	
bis(2-Chloroethyl) ether	ND	9.4	
2-Chlorophenol	ND	9.4	
1,3-Dichlorobenzene	ND	9.4	
1,4-Dichlorobenzene	ND	9.4	
Benzyl Alcohol	ND	19	
1,2-Dichlorobenzene	ND	9.4	
2-Methylphenol	ND	9.4	
bis(2-Chloroisopropyl)ether	ND	9.4	
4-Methylphenol	ND	9.4	
N-Nitroso-Di-N-propylamine	ND	9.4	
Hexachloroethane	ND	9.4	
Nitrobenzene	ND	9.4	
Isophorone	ND	9.4	
2-Nitrophenol	ND	9.4	
2,4-Dimethylphenol	ND	9.4	
Benzoic Acid	ND	47	
bis(2-Chloroethoxy)methane	ND	9.4	
2,4-Dichlorophenol	ND	9.4	
1,2,4-Trichlorobenzene	ND	9.4	
Naphthalene	ND	9.4	
4-Chloroaniline	ND	19	
Hexachlorobutadiene	ND	9.4	
4-Chloro-3-methylphenol	ND	19	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31448
April 28, 1993

Lab Sample No. 31448-4
Matrix: Water

Client ID: CP-116M-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	9.4	
Hexachlorocyclopentadiene	ND	9.4	
2,4,6-Trichlorophenol	ND	9.4	
2,4,5-Trichlorophenol	ND	9.4	
2-Chloronaphthalene	ND	9.4	
2-Nitroaniline	ND	47	
Dimethyl phthalate	ND	9.4	
Acenaphthylene	ND	9.4	
2,6-Dinitrotoluene	ND	9.4	
3-Nitroaniline	ND	47	
Acenaphthene	ND	9.4	
2,4-Dinitrophenol	ND	47	
4-Nitrophenol	ND	47	
Dibenzofuran	ND	9.4	
2,4-Dinitrotoluene	ND	9.4	
Diethylphthalate	ND	9.4	
4-Chlorophenyl phenyl ether	ND	9.4	
Fluorene	ND	9.4	
4-Nitroaniline	ND	47	
4,6-Dinitro-2-methylphenol	ND	47	
N-Nitrosodiphenylamine	ND	9.4	
4-Bromophenyl phenyl ether	ND	9.4	
Hexachlorobenzene	ND	9.4	
Pentachlorophenol	ND	47	
Phenanthrene	ND	9.4	
Anthracene	ND	9.4	
Di-n-butylphthalate	8.0	9.4	B1, J

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
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 Lab No. 31448
 April 28, 1993

Lab Sample No. 31448-4
 Matrix: Water

Client ID: CP-116M-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.4	
Pyrene	ND	9.4	
Butyl benzyl phthalate	ND	9.4	
3,3'-Dichlorobenzidine	ND	19	
Benzo(a)anthracene	ND	9.4	
Chrysene	ND	9.4	
bis(2-ethylhexyl)phthalate	ND	9.4	
Di-n-octyl phthalate	ND	9.4	
Benzo(b)fluoranthene	ND	9.4	
Benzo(k)fluoranthene	ND	9.4	
Benzo(a)pyrene	ND	9.4	
Indeno(1,2,3-cd)pyrene	ND	9.4	
Dibenz(a,h)anthracene	ND	9.4	
Benzo(g,h,i)perylene	ND	9.4	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	79	35 - 114	23 - 120
2-Fluorobiphenyl	66	43 - 116	30 - 115
p-Terphenyl-d ₁₄	88	33 - 141	18 - 137
Phenol-d ₆	22	10 - 94	24 - 113
2-Fluorophenol	46	21 - 100	25 - 121
2,4,6-Tribromophenol	75	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab Sample No. 31448-4
Matrix: Water

Client ID: CP-116M-0493

TPH Per EPA Method 418.1
Date Extracted: 4-19-93
Date Analyzed: 4-20-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	32	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-21-93
Date Analyzed: 4-22-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	92
o-terphenyl	112

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
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Lab No. 31448
April 28, 1993

Lab Sample No. 31448-5
Matrix: Water

Client ID: CP-116-0493

Volatile Organics by Method 8240
Date Analyzed: 4-20-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	7.5	10	J
Chloroethane	4.7	10	J
Methylene Chloride	ND	5	
Acetone	18	50	B1, J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	0.21	5	J
1,1-Dichloroethane	96	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	0.96	25	J
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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April 28, 1993

Lab Sample No. 31448-5
Matrix: Water

Client ID: CP-116-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	23	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	5.5	5	
Chlorobenzene	ND	5	
Ethyl Benzene	12	5	
Styrene	ND	5	
Total Xylenes	27	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	103	88 - 110	81 - 117
Bromofluorobenzene	91	86 - 115	74 - 121
1,2-Dichloroethane-D4	94	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31448
April 28, 1993

Lab Sample No. 31448-5
Matrix: Water

Client ID: CP-116-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-20-93
Date Analyzed: 4-21-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	20	J
bis(2-Chloroethyl) ether	ND	20	
2-Chlorophenol	ND	20	
1,3-Dichlorobenzene	ND	20	
1,4-Dichlorobenzene	ND	20	
Benzyl Alcohol	ND	40	
1,2-Dichlorobenzene	ND	20	
2-Methylphenol	ND	20	
bis(2-Chloroisopropyl)ether	ND	20	
4-Methylphenol	ND	20	
N-Nitroso-Di-N-propylamine	ND	20	
Hexachloroethane	ND	20	
Nitrobenzene	ND	20	
Isophorone	ND	20	
2-Nitrophenol	ND	20	
2,4-Dimethylphenol	15	20	
Benzoic Acid	ND	100	
bis(2-Chloroethoxy)methane	ND	20	
2,4-Dichlorophenol	ND	20	
1,2,4-Trichlorobenzene	ND	20	
Naphthalene	ND	20	
4-Chloroaniline	ND	40	
Hexachlorobutadiene	ND	20	
4-Chloro-3-methylphenol	200	40	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
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Lab No. 31448
April 28, 1993

Lab Sample No. 31448-5
Matrix: Water

Client ID: CP-116-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	20	
Hexachlorocyclopentadiene	ND	20	
2,4,6-Trichlorophenol	ND	20	
2,4,5-Trichlorophenol	ND	20	
2-Chloronaphthalene	ND	20	
2-Nitroaniline	ND	100	
Dimethyl phthalate	ND	20	
Acenaphthylene	ND	20	
2,6-Dinitrotoluene	ND	20	
3-Nitroaniline	ND	100	
Acenaphthene	2.4	20	J
2,4-Dinitrophenol	ND	100	
4-Nitrophenol	ND	100	
Dibenzofuran	ND	20	
2,4-Dinitrotoluene	ND	20	
Diethylphthalate	ND	20	
4-Chlorophenyl phenyl ether	ND	20	
Fluorene	ND	20	
4-Nitroaniline	ND	100	
4,6-Dinitro-2-methylphenol	ND	100	
N-Nitrosodiphenylamine	ND	20	
4-Bromophenyl phenyl ether	ND	20	
Hexachlorobenzene	ND	20	
Pentachlorophenol	ND	100	
Phenanthrene	1.9	20	J
Anthracene	ND	20	
Di-n-butylphthalate	16	20	B1, J

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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 Project: 624878-7306 Pier 91
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 Lab No. 31448
 April 28, 1993

Lab Sample No. 31448-5
 Matrix: Water

Client ID: CP-116-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	20	
Pyrene	ND	20	
Butyl benzyl phthalate	ND	20	
3,3'-Dichlorobenzidine	ND	40	
Benzo(a)anthracene	ND	20	
Chrysene	ND	20	
bis(2-ethylhexyl)phthalate	ND	20	
Di-n-octyl phthalate	ND	20	
Benzo(b)fluoranthene	ND	20	
Benzo(k)fluoranthene	ND	20	
Benzo(a)pyrene	ND	20	
Indeno(1,2,3-cd)pyrene	ND	20	
Dibenz(a,h)anthracene	ND	20	
Benzo(g,h,i)perylene	ND	20	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	67	35 - 114	23 - 120
2-Fluorobiphenyl	87	43 - 116	30 - 115
p-Terphenyl-d ₁₄	90	33 - 141	18 - 137
Phenol-d ₆	22	10 - 94	24 - 113
2-Fluorophenol	45	21 - 100	25 - 121
2,4,6-Tribromophenol	89	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 30 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-5
Matrix: Water

Client ID: CP-116-0493

TPH Per EPA Method 418.1
Date Extracted: 4-19-93
Date Analyzed: 4-20-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	86	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-21-93
Date Analyzed: 4-22-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	5.1	0.75	X2
TPH as Gasoline, Diesel			

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	98
o-terphenyl	119

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 31 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-6
Matrix: Water

Client ID: CP-39-3-0493

Volatile Organics by Method 8240
Date Analyzed: 4-20-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	J
Bromomethane	ND	10	
Vinyl Chloride	4.1	10	
Chloroethane	130	10	
Methylene Chloride	1.0	5	B1, J
Acetone	4.4	50	B1, J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	10	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 32 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-6
Matrix: Water

Client ID: CP-39-3-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	14	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	6.9	5	
Chlorobenzene	ND	5	
Ethyl Benzene	11	5	
Styrene	ND	5	
Total Xylenes	60	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	104	88 - 110	81 - 117
Bromofluorobenzene	90	86 - 115	74 - 121
1,2-Dichloroethane-D4	94	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 33 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-6
Matrix: Water

Client ID: CP-39-3-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-20-93
Date Analyzed: 4-21-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	10	
bis(2-Chloroethyl) ether	ND	10	
2-Chlorophenol	ND	10	
1,3-Dichlorobenzene	ND	10	
1,4-Dichlorobenzene	ND	10	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	10	
2-Methylphenol	ND	10	
bis(2-Chloroisopropyl)ether	ND	10	
4-Methylphenol	ND	10	
N-Nitroso-Di-N-propylamine	ND	10	
Hexachloroethane	ND	10	
Nitrobenzene	ND	10	
Isophorone	ND	10	
2-Nitrophenol	ND	10	
2,4-Dimethylphenol	ND	10	
Benzoic Acid	ND	50	
bis(2-Chloroethoxy)methane	ND	10	
2,4-Dichlorophenol	ND	10	
1,2,4-Trichlorobenzene	ND	10	
Naphthalene	3.2	10	J
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	10	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 34 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-6
Matrix: Water

Client ID: CP-39-3-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	35	10	
Hexachlorocyclopentadiene	ND	10	
2,4,6-Trichlorophenol	ND	10	
2,4,5-Trichlorophenol	ND	10	
2-Chloronaphthalene	ND	10	
2-Nitroaniline	ND	50	
Dimethyl phthalate	ND	10	
Acenaphthylene	ND	10	
2,6-Dinitrotoluene	ND	10	
3-Nitroaniline	ND	50	
Acenaphthene	7.3	10	J
2,4-Dinitrophenol	ND	50	
4-Nitrophenol	ND	50	
Dibenzofuran	ND	10	
2,4-Dinitrotoluene	ND	10	
Diethylphthalate	ND	10	
4-Chlorophenyl phenyl ether	ND	10	
Fluorene	10	10	
4-Nitroaniline	ND	50	
4,6-Dinitro-2-methylphenol	ND	50	
N-Nitrosodiphenylamine	ND	10	
4-Bromophenyl phenyl ether	ND	10	
Hexachlorobenzene	ND	10	
Pentachlorophenol	ND	50	
Phenanthrene	4.2	10	J
Anthracene	ND	10	
Di-n-butylphthalate	11	10	B1

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
 Page 35 of 38
 Lab No. 31448
 April 28, 1993

Lab Sample No. 31448-6
 Matrix: Water

Client ID: CP-39-3-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	10	
Pyrene	ND	10	
Butyl benzyl phthalate	ND	10	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	10	
Chrysene	ND	10	
bis(2-ethylhexyl)phthalate	ND	10	
Di-n-octyl phthalate	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Indeno(1,2,3-cd)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	72	35 - 114	23 - 120
2-Fluorobiphenyl	79	43 - 116	30 - 115
p-Terphenyl-d ₁₄	78	33 - 141	18 - 137
Phenol-d ₆	25	10 - 94	24 - 113
2-Fluorophenol	50	21 - 100	25 - 121
2,4,6-Tribromophenol	83	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 36 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-6
Matrix: Water

Client ID: CP-39-3-0493

TPH Per EPA Method 418.1
Date Extracted: 4-19-93
Date Analyzed: 4-20-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	54	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-21-93
Date Analyzed: 4-22-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	1.6	0.75	X2
TPH as	Gasoline		

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	105
o-terphenyl	128

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 37 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-7
Matrix: Oil

Client ID: CP-109-0493

WTPH-HCID
Date Extracted: 4-19-93
Date Analyzed: 4-20-93

<u>Parameters</u>	<u>Concentration, mg/kg</u>	<u>Flag</u>
Gasoline (C7 - C12)	> 20	
Diesel (> C12 - C24)	> 50	
Heavy Oil (C24+)	> 100	

SURROGATE RECOVERY, %

1-chlorooctane	X10
o-terphenyl	X10

ND - Not Detected
PQL - Practical Quantitation Limit

<u>Parameter</u>	<u>Result</u>
Specific gravity	0.8947

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 38 of 38
Lab No. 31448
April 28, 1993

Lab Sample No. 31448-8
Matrix: Oil

Client ID: CP-39-3-0493

WTPH-HCID
Date Extracted: 4-19-93
Date Analyzed: 4-20-93

<u>Parameters</u>	<u>Concentration, mg/kg</u>	<u>Flag</u>
Gasoline (C7 - C12)	> 20	
Diesel (> C12 - C24)	> 50	
Heavy Oil (C24+)	> 100	

SURROGATE RECOVERY, %

1-chlorooctane	X10
o-terphenyl	X10

ND - Not Detected
PQL - Practical Quantitation Limit

<u>Parameter</u>	<u>Result</u>
Specific gravity	0.8745



BURLINGTON ENVIRONMENTAL

RECEIVED

MAY 10 1993

May 10, 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Burlington Environmental Inc.
Technical Services

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46115

Dear Joe:

Five water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 7, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals and PCBs at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report. The PCBs were extracted and analyzed in batches. These dates are tabulated below. All PCB surrogates recovered between 50% and 150%.

Laboratory Number(s)	GC Run Number(s)	Date(s) Extracted	Date(s) Analyzed
46115-1,2,3,4,5, M04083-1, and B04083-1	AAKZ, CAFX	4/08/93	4/12/93, 4/27/93

The analyst(s) name(s) and the instrument used for each analyte are specified on the PCB report and are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure



BURLINGTON
ENVIRONMENTAL

General Laboratory Report

Lab Number : 46115

Plant/Generator Name : Pier 91; Project #624878 Task 7306

Sample Type : Groundwater; CP-111, -911, -113, -114, -112

Date of Receipt : 04/07/93 Analyst: BB,EL,JLB,DKW

Date of Report : 05/07/93 QC Checked: *Kathy Keys*

Parameters for Analysis: Total and Dissolved Metals, PCBs

Outside Lab : None Outside Lab Report No:

Data:

These water samples from Pier 91 Project #624878, Task 7306, sample numbers CP-111-0493, CP-911-0493, CP-113-0493, CP-114-0493, CP-112-0493 were analyzed for Total and Dissolved Metals by Methods 7000 and 6010 and PCBs by Methods 8080. Copies of the results are attached.

Comments and Conclusions:



CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6328

[illegible]

RELINQUISHED BY

RECEIVED BY

RECEIVED BY		DATE		TIME		RECEIVED BY		DATE		TIME	
SIGNATURE		DATE		TIME		SIGNATURE		DATE		TIME	
Louis A. La Rosa		4-7-93		1645		Attley Greps		4/7/13		1700	
SHIPPING NOTES						LAB NOTES					

PCB Laboratory Report

Page 1

Lab Number : 46115

Plant/Generator Name : / PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/07/93 Analyst: BB,EL,JLB,DKW
Date of Report : 04/29/93 QC Checked: SA 5/2/93
Outside Lab : NONE Outside Lab Report No:
Number of Samples :

<u>Run #</u>	<u>Sample ID</u>	<u>Code Numbers</u>	<u># Drums in Composite</u>	<u>Aroclor #</u>	<u>Total PCB (ppm)</u>
AAKZ27	B04083-1	BLANK			<0.1ppb
AAKX26	M04083-1	METHOD SPIKE		1248	135%
CAFX21	46115-1	CP-111-0493			<50ppb
CAFX22	46115-2	CP-911-0493			<50ppb
AAKZ22	46115-3	CP-113-0493			<0.1ppb
AAKZ23	46115-4	CP-114-0493			<0.1ppb
AAKZ24	46115-5	CP-112-0493			<0.1ppb
AAKZ19	CCV	5 PPM CCV (89%)		1254	4.46
AAKZ30	CCV	5 PPM CCV (111%)		1248	5.57
)			
CAFX15	CCV	5 PPM CCV (101%)		1248	5.04
)			
CAFX26	CCV	5 PPM CCV (110%)		1248	5.49
)			

Instruments: Hewlett Packard 5890 and 5890 Series II G.C.s

Analysts: Al Flores-Serrano and Della Kay Wilson

Metals Laboratory Report

Lab Number : 46115

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/07/93

Analyst: BB, EL, JLB,

Date of Report : 04/20/93

QC Checked: *[Signature]*

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab : NONE

Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	46115-1 TOTAL	46115-1 DISS.	46115-2 TOTAL	46115-2 DISS.
Metals:	CP-111-0493	CP-111-0493	CP-911-0493	CP-911-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

DATES ANALYZED: 4/14/93, 4/15/93, 4/16/93, 4/19/93

Metals Laboratory Report

Lab Number : 46115

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/07/93

Analyst: BB, EL, JLB

Date of Report : 04/20/93

QC Checked: *[Signature]*

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab : NONE

Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	46115-3 TOTAL	46115-3 DISS.	46115-4 TOTAL	46115-4 DISS.
Metals:	CP-113-0493	CP-113-0493	CP-114-0493	CP-114-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

Metals Laboratory Report

Lab Number : 46115

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306

Sample Type : GROUNDWATER

Date of Receipt : 04/07/93

Analyst: BB, EL, JLB

Date of Report : 04/20/93

QC Checked: *[Signature]*

Parameters for Analysis: TOTAL AND DISSOLVED METALS

Outside Lab : NONE

Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46115-5 TOTAL CP-112-0493	46115-5 DISS. CP-112-0493	46115-1 MS % RECOVERY	46115-1 MSD % RECOVERY
Silver	<0.010	<0.010		
Arsenic	<0.010	<0.010	85.0	87.5
Barium	<0.20	<0.20		
Beryllium	<0.005	<0.005		
Cadmium	<0.005	<0.005		
Chromium	<0.010	<0.010		
Copper	<0.025	<0.025		
Mercury	<0.0002	<0.0002	103.0*	99.5*
Nickel	<0.040	<0.040		
Lead	<0.003	<0.003	85.0	71.5
Selenium	<0.005	<0.005	80.0	50.0
Zinc	<0.020	<0.020		

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

*MERCURY SPIKES PERFORMED ON 46115-4.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

RECEIVED

MAY 25 1993

Burlington Environmental Inc.
Technical Services

DATE: May 20, 1993

TO: David Broten, Burlington Environmental Technical Services

PROJECT NAME: Pier 91

PROJECT NUMBER: 624878-7306

LABORATORY NUMBER: 31308

Enclosed are one original and one copy of the Tier II data deliverables package for Laboratory Work Order Number 31308. The samples were received for analysis at Sound Analytical Services, Inc., on April 8, 1993.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,



Andrew J. Riddell
Project Manager

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

May 20, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7306

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 31308

The samples were taken on 4/07/93 and were received at Sound on 4/08/93. The samples were analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons by EPA Method 418.1 modified for soil, and Total Petroleum Fuel Hydrocarbons by EPA Method 8015 modified.

VOLATILE ORGANICS

Samples 31308-1 through 31308-6 were analyzed on 4/14/93. Methylene chloride and acetone were detected in the method blanks at levels above the IDL. Results reported for these compounds in the associated samples were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS

Samples 31308-1 through 31308-5 were extracted on 4/09/93 and analyzed on 4/12/93. No compounds were detected in the method blank above the IDL. All QC parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS

Samples 31308-1 through 31308-5 were extracted on 4/12/93 and analyzed on 4/14/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS

Samples 31308-1 through 31308-5 were extracted on 4/12/93 and analyzed on 4/13/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental, Date: April 15, 1993
Technical Services

Report On: Analysis of Water

Lab No.: 31308

Page 1 of 32

IDENTIFICATION:

Samples received on 04-08-93

Project: 624878-7306 Pier 91

ANALYSIS:

Lab Sample No. 31308-1

Client ID: CP-111-0493

Volatile Organics by Method 8240

Date Analyzed: 4-14-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	4.2	20	J
Methylene Chloride	62	10	B1
Acetone	2.8	100	B1,J
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	ND	10	
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	4.6	10	J
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
Page 2 of 32
Lab No. 31308
April 15, 1993

Lab Sample No. 31308-1

Client ID: CP-111-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	10	
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	2.6	10	J
Chlorobenzene	ND	10	
Ethyl Benzene	2.0	10	J
Styrene	ND	10	
Total Xylenes	2.4	10	J

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	101	88 - 110	81 - 117
Bromofluorobenzene	93	86 - 115	74 - 121
1,2-Dichloroethane-D4	105	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
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Lab No. 31308
April 15, 1993

Lab Sample No. 31308-1

Client ID: CP-111-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-9-93

Date Analyzed: 4-12-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	110	
bis(2-Chloroethyl) ether	ND	110	
2-Chlorophenol	ND	110	
1,3-Dichlorobenzene	ND	110	
1,4-Dichlorobenzene	ND	110	
Benzyl Alcohol	ND	210	
1,2-Dichlorobenzene	ND	110	
2-Methylphenol	ND	110	
bis(2-Chloroisopropyl) ether	ND	110	
4-Methylphenol	ND	110	
N-Nitroso-Di-N-propylamine	ND	110	
Hexachloroethane	ND	110	
Nitrobenzene	ND	110	
Isophorone	ND	110	
2-Nitrophenol	ND	110	
2,4-Dimethylphenol	ND	110	
Benzoic Acid	ND	530	
bis(2-Chloroethoxy) methane	ND	110	
2,4-Dichlorophenol	ND	110	
1,2,4-Trichlorobenzene	ND	110	
Naphthalene	ND	110	
4-Chloroaniline	ND	210	
Hexachlorobutadiene	ND	110	
4-Chloro-3-methylphenol	ND	210	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31308
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Lab Sample No. 31308-1

Client ID: CP-111-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	110	
Hexachlorocyclopentadiene	ND	110	
2,4,6-Trichlorophenol	ND	110	
2,4,5-Trichlorophenol	ND	110	
2-Chloronaphthalene	ND	110	
2-Nitroaniline	ND	530	
Dimethyl phthalate	ND	110	
Acenaphthylene	ND	110	
2,6-Dinitrotoluene	ND	110	
3-Nitroaniline	ND	530	
Acenaphthene	ND	110	
2,4-Dinitrophenol	ND	530	
4-Nitrophenol	ND	530	
Dibenzofuran	ND	110	
2,4-Dinitrotoluene	ND	110	
Diethylphthalate	ND	110	
4-Chlorophenyl phenyl ether	ND	110	
Fluorene	ND	110	
4-Nitroaniline	ND	530	
4,6-Dinitro-2-methylphenol	ND	530	
N-Nitrosodiphenylamine	ND	110	
4-Bromophenyl phenyl ether	ND	110	
Hexachlorobenzene	ND	110	
Pentachlorophenol	ND	530	
Phenanthrene	ND	110	
Anthracene	ND	110	
Di-n-butylphthalate	ND	110	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
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 Lab No. 31308
 April 15, 1993

Lab Sample No. 31308-1

Client ID: CP-111-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	110	
Pyrene	ND	110	
Butyl benzyl phthalate	ND	110	
3,3'-Dichlorobenzidine	ND	210	
Benzo(a)anthracene	ND	110	
Chrysene	ND	110	
bis(2-ethylhexyl)phthalate	ND	110	
Di-n-octyl phthalate	ND	110	
Benzo(b)fluoranthene	ND	110	
Benzo(k)fluoranthene	ND	110	
Benzo(a)pyrene	ND	110	
Indeno(1,2,3-cd)pyrene	ND	110	
Dibenz(a,h)anthracene	ND	110	
Benzo(g,h,i)perylene	ND	110	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	63	35 - 114	23 - 120
2-Fluorobiphenyl	73	43 - 116	30 - 115
p-Terphenyl-d ₁₄	67	33 - 141	18 - 137
Phenol-d ₆	16	10 - 94	24 - 113
2-Fluorophenol	38	21 - 100	25 - 121
2,4,6-Tribromophenol	59	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31308
April 15, 1993

Lab Sample No. 31308-1

Client ID: CP-111-0493

TPH Per EPA Method 418.1
Date Extracted: 4-12-93
Date Analyzed: 4-13-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	30	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-12-93
Date Analyzed: 1-14-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	45	0.75	
TPH as	Diesel		

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	92
o-terphenyl	100

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Project: 624878-7306 Pier 91
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Lab No. 31308
April 15, 1993

Lab Sample No. 31308-2

Client ID: CP-911-0493

Volatile Organics by Method 8240
Date Analyzed: 4-14-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	3.8	20	J
Methylene Chloride	56	10	B1
Acetone	5.2	100	B1,J
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	ND	10	
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	4.4	10	J
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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 Lab No. 31308
 April 15, 1993

Lab Sample No. 31308-2

Client ID: CP-911-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	10	
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	2.8	10	J
Chlorobenzene	ND	10	
Ethyl Benzene	2.2	10	J
Styrene	ND	10	
Total Xylenes	2.6	10	J

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	100	88 - 110	81 - 117
Bromofluorobenzene	96	86 - 115	74 - 121
1,2-Dichloroethane-D4	106	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

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April 15, 1993

Lab Sample No. 31308-2

Client ID: CP-911-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-9-93

Date Analyzed: 4-12-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	110	
bis(2-Chloroethyl) ether	ND	110	
2-Chlorophenol	ND	110	
1,3-Dichlorobenzene	ND	110	
1,4-Dichlorobenzene	ND	110	
Benzyl Alcohol	ND	210	
1,2-Dichlorobenzene	ND	110	
2-Methylphenol	ND	110	
bis(2-Chloroisopropyl)ether	ND	110	
4-Methylphenol	ND	110	
N-Nitroso-Di-N-propylamine	ND	110	
Hexachloroethane	ND	110	
Nitrobenzene	ND	110	
Isophorone	ND	110	
2-Nitrophenol	ND	110	
2,4-Dimethylphenol	ND	110	
Benzoic Acid	ND	530	
bis(2-Chloroethoxy)methane	ND	110	
2,4-Dichlorophenol	ND	110	
1,2,4-Trichlorobenzene	ND	110	
Naphthalene	ND	110	
4-Chloroaniline	ND	210	
Hexachlorobutadiene	ND	110	
4-Chloro-3-methylphenol	ND	210	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Project: 624878-7306 Pier 91
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Lab No. 31308
April 15, 1993

Lab Sample No. 31308-2

Client ID: CP-911-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	110	
Hexachlorocyclopentadiene	ND	110	
2,4,6-Trichlorophenol	ND	110	
2,4,5-Trichlorophenol	ND	110	
2-Chloronaphthalene	ND	110	
2-Nitroaniline	ND	530	
Dimethyl phthalate	ND	110	
Acenaphthylene	ND	110	
2,6-Dinitrotoluene	ND	110	
3-Nitroaniline	ND	530	
Acenaphthene	ND	110	
2,4-Dinitrophenol	ND	530	
4-Nitrophenol	ND	530	
Dibenzofuran	ND	110	
2,4-Dinitrotoluene	ND	110	
Diethylphthalate	ND	110	
4-Chlorophenyl phenyl ether	ND	110	
Fluorene	ND	110	
4-Nitroaniline	ND	530	
4,6-Dinitro-2-methylphenol	ND	530	
N-Nitrosodiphenylamine	ND	110	
4-Bromophenyl phenyl ether	ND	110	
Hexachlorobenzene	ND	110	
Pentachlorophenol	ND	530	
Phenanthrene	ND	110	
Anthracene	ND	110	
Di-n-butylphthalate	ND	110	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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 Lab No. 31308
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Lab Sample No. 31308-2

Client ID: CP-911-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	110	J
Pyrene	ND	110	
Butyl benzyl phthalate	ND	110	
3,3'-Dichlorobenzidine	ND	210	
Benzo(a)anthracene	ND	110	
Chrysene	ND	110	
bis(2-ethylhexyl)phthalate	17	110	
Di-n-octyl phthalate	ND	110	
Benzo(b)fluoranthene	ND	110	
Benzo(k)fluoranthene	ND	110	
Benzo(a)pyrene	ND	110	
Indeno(1,2,3-cd)pyrene	ND	110	
Dibenz(a,h)anthracene	ND	110	
Benzo(g,h,i)perylene	ND	110	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	58	35 - 114	23 - 120
2-Fluorobiphenyl	62	43 - 116	30 - 115
p-Terphenyl-d ₁₄	64	33 - 141	18 - 137
Phenol-d ₆	18	10 - 94	24 - 113
2-Fluorophenol	39	21 - 100	25 - 121
2,4,6-Tribromophenol	61	10 - 123	19 - 122

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31308
April 15, 1993

Lab Sample No. 31308-2

Client ID: CP-911-0493

TPH Per EPA Method 418.1
Date Extracted: 4-12-93
Date Analyzed: 4-13-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	6.1	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-12-93
Date Analyzed: 4-14-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	2.0	0.75	
TPH as	Diesel		

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	84
o-terphenyl	91

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Lab No. 31308
April 15, 1993

Lab Sample No. 31308-3

Client ID: CP-113-0493

Volatile Organics by Method 8240
Date Analyzed: 4-14-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	B1, J
Bromomethane	ND	10	
Vinyl Chloride	39	10	
Chloroethane	ND	10	
Methylene Chloride	1.3	5	
Acetone	ND	50	J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	35	5	
1,2-Dichloroethene (Total)	1.8	5	
Chloroform	0.78	5	J
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	16	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	J
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	49	5	
Dibromochloromethane	ND	5	J
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

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Project: 624878-7306 Pier 91
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Lab No. 31308
April 15, 1993

Lab Sample No. 31308-3

Client ID: CP-113-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	98	88 - 110	81 - 117
Bromofluorobenzene	96	86 - 115	74 - 121
1,2-Dichloroethane-D4	106	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
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Lab No. 31308
April 15, 1993

Lab Sample No. 31308-3

Client ID: CP-113-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-9-93

Date Analyzed: 4-12-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.8	
bis(2-Chloroethyl) ether	ND	9.8	
2-Chlorophenol	ND	9.8	
1,3-Dichlorobenzene	ND	9.8	
1,4-Dichlorobenzene	ND	9.8	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	9.8	
2-Methylphenol	ND	9.8	
bis(2-Chloroisopropyl) ether	ND	9.8	
4-Methylphenol	ND	9.8	
N-Nitroso-Di-N-propylamine	ND	9.8	
Hexachloroethane	ND	9.8	
Nitrobenzene	ND	9.8	
Isophorone	ND	9.8	
2-Nitrophenol	ND	9.8	
2,4-Dimethylphenol	ND	9.8	
Benzoic Acid	ND	49	
bis(2-Chloroethoxy) methane	ND	9.8	
2,4-Dichlorophenol	ND	9.8	
1,2,4-Trichlorobenzene	ND	9.8	
Naphthalene	ND	9.8	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	9.8	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
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Lab No. 31308
April 15, 1993

Lab Sample No. 31308-3

Client ID: CP-113-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	9.8	
Hexachlorocyclopentadiene	ND	9.8	
2,4,6-Trichlorophenol	ND	9.8	
2,4,5-Trichlorophenol	ND	9.8	
2-Chloronaphthalene	ND	9.8	
2-Nitroaniline	ND	49	
Dimethyl phthalate	ND	9.8	
Acenaphthylene	ND	9.8	
2,6-Dinitrotoluene	ND	9.8	
3-Nitroaniline	ND	49	
Acenaphthene	ND	9.8	
2,4-Dinitrophenol	ND	49	
4-Nitrophenol	ND	49	
Dibenzofuran	ND	9.8	
2,4-Dinitrotoluene	ND	9.8	
Diethylphthalate	ND	9.8	
4-Chlorophenyl phenyl ether	ND	9.8	
Fluorene	ND	9.8	
4-Nitroaniline	ND	49	
4,6-Dinitro-2-methylphenol	ND	49	
N-Nitrosodiphenylamine	ND	9.8	
4-Bromophenyl phenyl ether	ND	9.8	
Hexachlorobenzene	ND	9.8	
Pentachlorophenol	ND	49	
Phenanthrene	ND	9.8	
Anthracene	ND	9.8	
Di-n-butylphthalate	3.1	9.8	J

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
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 Lab No. 31308
 April 15, 1993

Lab Sample No. 31308-3

Client ID: CP-113-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.8	J
Pyrene	ND	9.8	
Butyl benzyl phthalate	ND	9.8	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	9.8	
Chrysene	ND	9.8	
bis(2-ethylhexyl)phthalate	6.2	9.8	
Di-n-octyl phthalate	ND	9.8	
Benzo(b)fluoranthene	ND	9.8	
Benzo(k)fluoranthene	ND	9.8	
Benzo(a)pyrene	ND	9.8	
Indeno(1,2,3-cd)pyrene	ND	9.8	
Dibenz(a,h)anthracene	ND	9.8	
Benzo(g,h,i)perylene	ND	9.8	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	62	35 - 114	23 - 120
2-Fluorobiphenyl	59	43 - 116	30 - 115
p-Terphenyl-d ₁₄	59	33 - 141	18 - 137
Phenol-d ₆	19	10 - 94	24 - 113
2-Fluorophenol	37	21 - 100	25 - 121
2,4,6-Tribromophenol	77	10 - 123	19 - 122

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
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Lab No. 31308
April 15, 1993

Lab Sample No. 31308-3

Client ID: CP-113-0493

TPH Per EPA Method 418.1
Date Extracted: 4-12-93
Date Analyzed: 4-13-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	2.1	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-12-93
Date Analyzed: 4-14-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	92
o-terphenyl	103

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
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Lab No. 31308
April 15, 1993

Lab Sample No. 31308-4

Client ID: CP-114-0493

Volatile Organics by Method 8240
Date Analyzed: 4-14-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	ND	5	
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
 Project: 624878-7306 Pier 91
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 Lab No. 31308
 April 15, 1993

Lab Sample No. 31308-4

Client ID: CP-114-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	99	88 - 110	81 - 117
Bromofluorobenzene	97	86 - 115	74 - 121
1,2-Dichloroethane-D4	110	76 - 114	70 - 121

Continued

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91
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Lab No. 31308
April 15, 1993

Lab Sample No. 31308-4

Client ID: CP-114-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-9-93

Date Analyzed: 4-12-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	10	
bis(2-Chloroethyl) ether	ND	10	
2-Chlorophenol	ND	10	
1,3-Dichlorobenzene	ND	10	
1,4-Dichlorobenzene	ND	10	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	10	
2-Methylphenol	ND	10	
bis(2-Chloroisopropyl)ether	ND	10	
4-Methylphenol	ND	10	
N-Nitroso-Di-N-propylamine	ND	10	
Hexachloroethane	ND	10	
Nitrobenzene	ND	10	
Isophorone	ND	10	
2-Nitrophenol	ND	10	
2,4-Dimethylphenol	ND	10	
Benzoic Acid	ND	50	
bis(2-Chloroethoxy)methane	ND	10	
2,4-Dichlorophenol	ND	10	
1,2,4-Trichlorobenzene	ND	10	
Naphthalene	ND	10	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	10	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31308-4

Client ID: CP-114-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	10	
Hexachlorocyclopentadiene	ND	10	
2,4,6-Trichlorophenol	ND	10	
2,4,5-Trichlorophenol	ND	10	
2-Chloronaphthalene	ND	10	
2-Nitroaniline	ND	50	
Dimethyl phthalate	ND	10	
Acenaphthylene	ND	10	
2,6-Dinitrotoluene	ND	10	
3-Nitroaniline	ND	50	
Acenaphthene	ND	10	
2,4-Dinitrophenol	ND	50	
4-Nitrophenol	ND	50	
Dibenzofuran	ND	10	
2,4-Dinitrotoluene	ND	10	
Diethylphthalate	ND	10	
4-Chlorophenyl phenyl ether	ND	10	
Fluorene	ND	10	
4-Nitroaniline	ND	50	
4,6-Dinitro-2-methylphenol	ND	50	
N-Nitrosodiphenylamine	ND	10	
4-Bromophenyl phenyl ether	ND	10	
Hexachlorobenzene	ND	10	
Pentachlorophenol	ND	50	
Phenanthrene	ND	10	
Anthracene	ND	10	
Di-n-butylphthalate	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31308-4

Client ID: CP-114-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	10	
Pyrene	ND	10	
Butyl benzyl phthalate	ND	10	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	10	
Chrysene	ND	10	
bis(2-ethylhexyl)phthalate	ND	10	
Di-n-octyl phthalate	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Indeno(1,2,3-cd)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	77	35 - 114	23 - 120
2-Fluorobiphenyl	58	43 - 116	30 - 115
p-Terphenyl-d ₁₄	57	33 - 141	18 - 137
Phenol-d ₆	24	10 - 94	24 - 113
2-Fluorophenol	48	21 - 100	25 - 121
2,4,6-Tribromophenol	79	10 - 123	19 - 122

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Lab Sample No. 31308-4

Client ID: CP-114-0493

TPH Per EPA Method 418.1
Date Extracted: 4-12-93
Date Analyzed: 4-13-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-12-93
Date Analyzed: 4-14-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	83
o-terphenyl	96

ND - Not Detected
PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31308-5

Client ID: CP-112-0493

Volatile Organics by Method 8240
Date Analyzed: 4-14-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	J B1, J
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	3.2	10	
Methylene Chloride	0.73	5	
Acetone	ND	50	J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	1.7	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	J
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	J
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	1.1	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued

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Lab Sample No. 31308-5

Client ID: CP-112-0493

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 4-9-93

Date Analyzed: 4-12-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.9	
bis(2-Chloroethyl) ether	ND	9.9	
2-Chlorophenol	ND	9.9	
1,3-Dichlorobenzene	ND	9.9	
1,4-Dichlorobenzene	ND	9.9	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	9.9	
2-Methylphenol	ND	9.9	
bis(2-Chloroisopropyl) ether	ND	9.9	
4-Methylphenol	ND	9.9	
N-Nitroso-Di-N-propylamine	ND	9.9	
Hexachloroethane	ND	9.9	
Nitrobenzene	ND	9.9	
Isophorone	ND	9.9	
2-Nitrophenol	ND	9.9	
2,4-Dimethylphenol	ND	9.9	
Benzoic Acid	ND	50	
bis(2-Chloroethoxy) methane	ND	9.9	
2,4-Dichlorophenol	ND	9.9	
1,2,4-Trichlorobenzene	ND	9.9	
Naphthalene	ND	9.9	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	9.9	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected

PQL - Practical Quantitation Limit

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Lab Sample No. 31308-5

Client ID: CP-112-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	1.8	5	J
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Toluene - D8	100	88 - 110	81 - 117
Bromofluorobenzene	102	86 - 115	74 - 121
1,2-Dichloroethane-D4	114	76 - 114	70 - 121

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Lab Sample No. 31308-5

Client ID: CP-112-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	9.9	
Hexachlorocyclopentadiene	ND	9.9	
2,4,6-Trichlorophenol	ND	9.9	
2,4,5-Trichlorophenol	ND	9.9	
2-Chloronaphthalene	ND	9.9	
2-Nitroaniline	ND	50	
Dimethyl phthalate	ND	9.9	
Acenaphthylene	ND	9.9	
2,6-Dinitrotoluene	ND	9.9	
3-Nitroaniline	ND	50	
Acenaphthene	ND	9.9	
2,4-Dinitrophenol	ND	50	
4-Nitrophenol	ND	50	
Dibenzofuran	ND	9.9	
2,4-Dinitrotoluene	ND	9.9	
Diethylphthalate	ND	9.9	
4-Chlorophenyl phenyl ether	ND	9.9	
Fluorene	ND	9.9	
4-Nitroaniline	ND	50	
4,6-Dinitro-2-methylphenol	ND	50	
N-Nitrosodiphenylamine	ND	9.9	
4-Bromophenyl phenyl ether	ND	9.9	
Hexachlorobenzene	ND	9.9	
Pentachlorophenol	ND	50	
Phenanthrene	ND	9.9	
Anthracene	ND	9.9	
Di-n-butylphthalate	3.0	9.9	J

ND - Not Detected

PQL - Practical Quantitation Limit

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Lab Sample No. 31308-5

Client ID: CP-112-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.9	J
Pyrene	ND	9.9	
Butyl benzyl phthalate	ND	9.9	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	9.9	
Chrysene	ND	9.9	
bis(2-ethylhexyl)phthalate	2.2	9.9	
Di-n-octyl phthalate	ND	9.9	
Benzo(b)fluoranthene	ND	9.9	
Benzo(k)fluoranthene	ND	9.9	
Benzo(a)pyrene	ND	9.9	
Indeno(1,2,3-cd)pyrene	ND	9.9	
Dibenz(a,h)anthracene	ND	9.9	
Benzo(g,h,i)perylene	ND	9.9	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits	
		Water	Soil
Nitrobenzene - d ₅	64	35 - 114	23 - 120
2-Fluorobiphenyl	52	43 - 116	30 - 115
p-Terphenyl-d ₁₄	53	33 - 141	18 - 137
Phenol-d ₆	23	10 - 94	24 - 113
2-Fluorophenol	45	21 - 100	25 - 121
2,4,6-Tribromophenol	75	10 - 123	19 - 122

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TPH Per EPA Method 418.1
Date Extracted: 4-12-93
Date Analyzed: 4-13-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Hydrocarbons	2.8	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-12-93
Date Analyzed: 4-14-93

<u>Parameter</u>	<u>Concentration, mg/L</u>	<u>PQL</u>	<u>Flag</u>
Total Petroleum Fuel Hydrocarbons	ND	0.75	

<u>SURROGATE RECOVERY, %</u>	
1-chlorooctane	92
o-terphenyl	106

ND - Not Detected
PQL - Practical Quantitation Limit

Continued